PAPER TRADE
JOURNAL
April 30, 1954

- *First Successes With the Closed Hood*
- *A Report of Mill Experiences With Synthetic-Content Felts*

WOOD PULP

G

Established 1886

"Opinions cannot survive if one has no chance to fight for them."

THOMAS MANN

The most beneficial of ideas has little utility unless properly communicated, and paper is the ideal and foremost conductor.

Man's opinions and thoughts, so vital to our way of life, carried to all frontiers by the products of the invaluable Pulp and Paper Industry, will always survive.

GOTTESMAN & COMPANY

— INCORPORATED —

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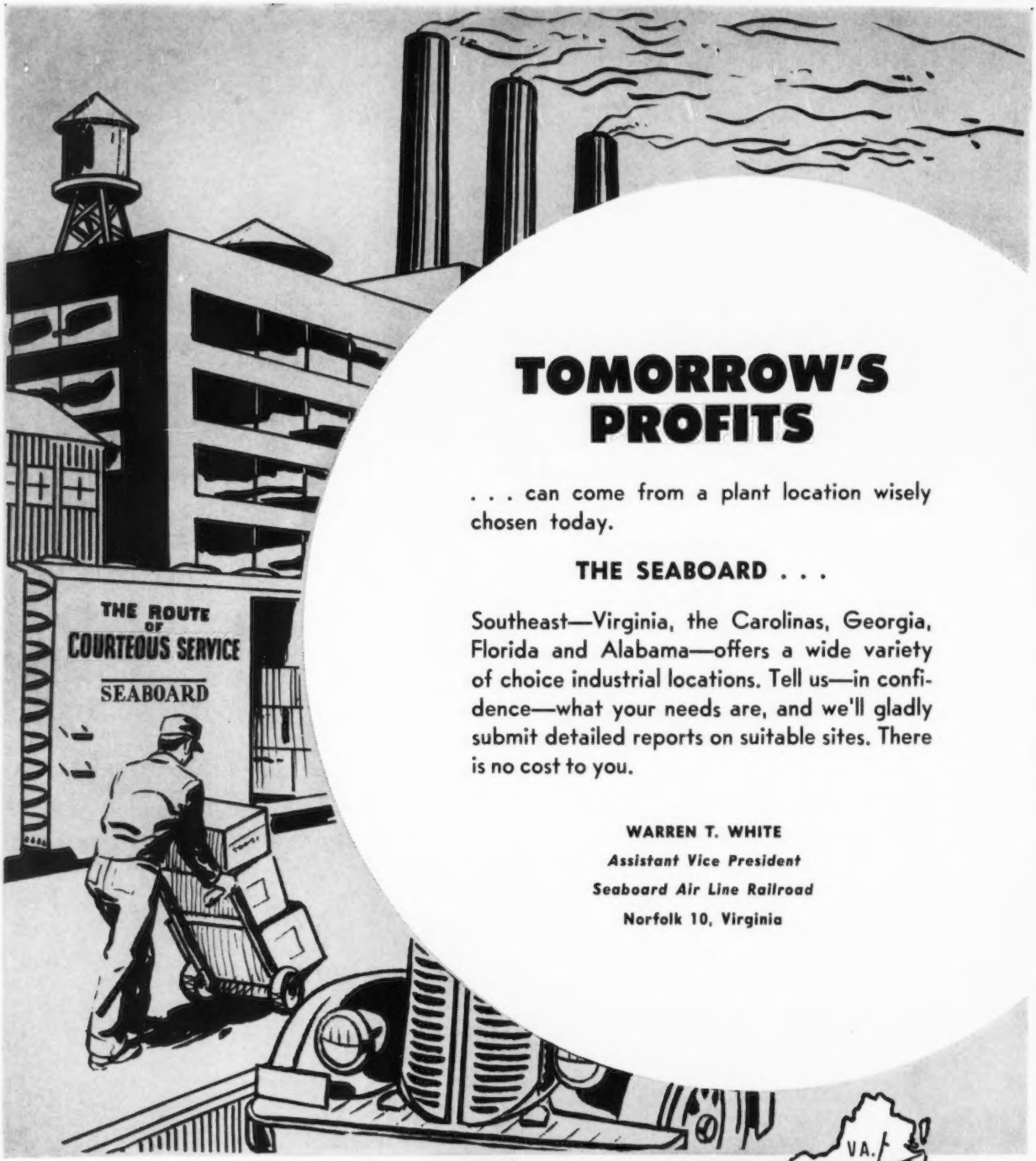

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. . . can come from a plant location wisely chosen today.

THE SEABOARD . . .

Southeast—Virginia, the Carolinas, Georgia, Florida and Alabama—offers a wide variety of choice industrial locations. Tell us—in confidence—what your needs are, and we'll gladly submit detailed reports on suitable sites. There is no cost to you.

WARREN T. WHITE
Assistant Vice President
Seaboard Air Line Railroad
Norfolk 10, Virginia

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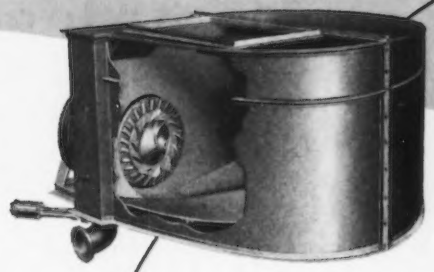
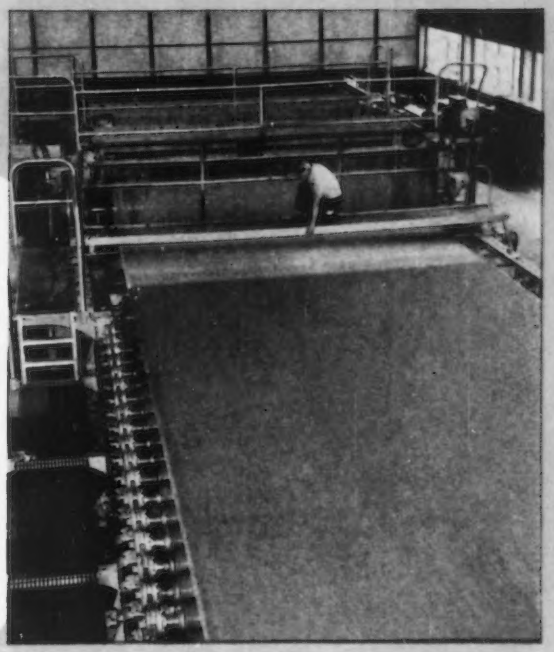
SEABOARD
AIR LINE RAILROAD

THROUGH THE HEART OF THE SOUTH

from pulp to paper

LEADERSHIP IMPLIES ABILITY





Ability to engineer out of sound experience and fabricate with precision.

Ability to ship on schedule, erect quickly and efficiently, start up smoothly.

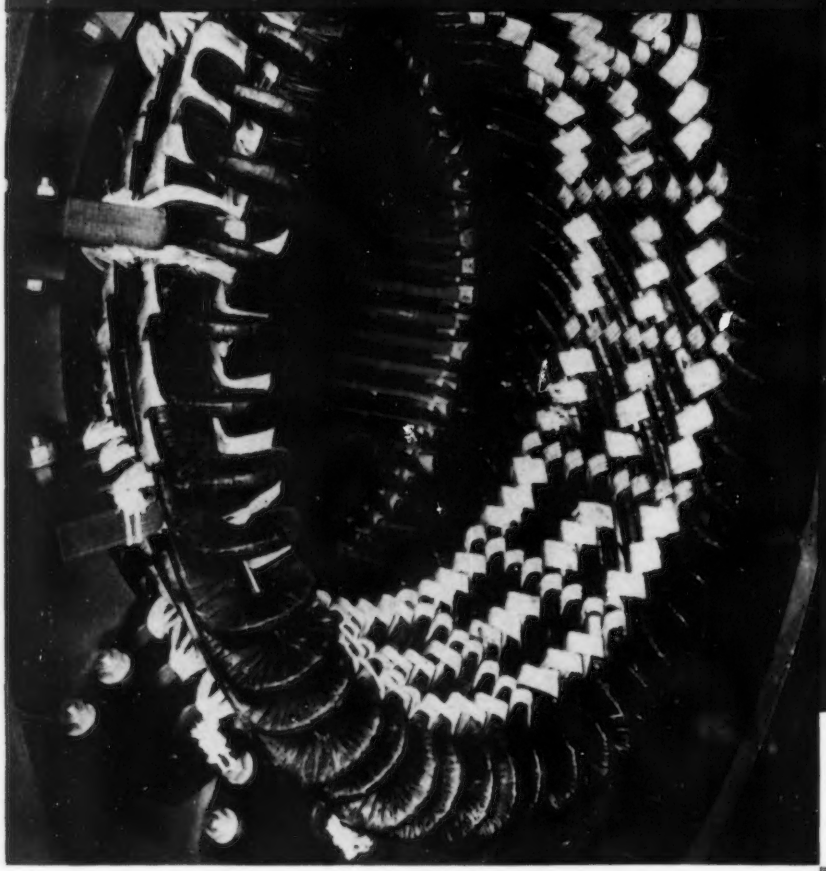
Ability to perform at any spot along the way from pulping to converting.

That's what mill managements want—that's what they get when they choose Black-Clawson as their supplier.

THE BLACK-CLAWSON COMPANY

Hamilton, Ohio
Middletown, Ohio
Fulton, N. Y.

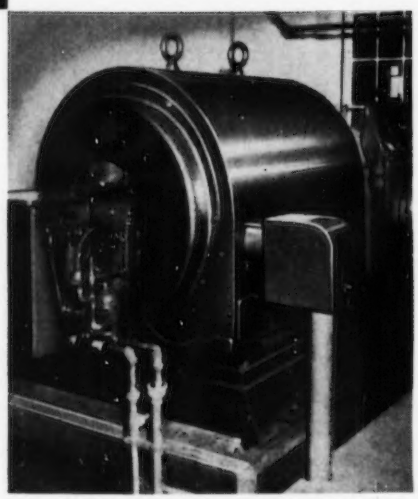
ELLIOTT CONSTRUCTION PRINCIPLES



mean longer life for motors on frequent starting service

You're looking inside a big Elliott two-pole induction motor—typical of those serving the industry on hydraulic barking pump drives and other tough installations. Note the extensive lashing used to restrain the movements of the stator coil end turns during starting. Fiberglas tape holds canvas phenolic blocks between adjacent coils in parallel rows which prevents coils within each phase group from pulling together during starting. This blocking also achieves an arch binding effect to restrict the coil phase groups from separating under starting stresses. The upper and lower portion of the coil end turns are lashed with Fiberglas cord to canvas phenolic blocks that are bolted to the frame to prevent any movement during starting.

Construction standards like this keep Elliott motor performance high. Ask your local Elliott representative for bulletins on the motor you need or write Elliott Company, Ridgway Division, Ridgway, Pa.



Elliott 900-hp two pole motor driving high-pressure centrifugal pump discharging at over 1300 psi, in a new pulp mill in the Northwest. Service requires an average of four starts per eight-hour shift.

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JOHN C. W. EVANS
EDITOR

D. BRUCE OTIS, JR.
ASSOCIATE EDITOR

E. P. NUTTALL
ASSOCIATE EDITOR

R. E. THUEMMES
MANAGING EDITOR

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REMEMBER THESE DATES

MAY 14-15: Research Day, University of Maine, Orono, Maine.

MAY 18: Technical Conference, Forest Products Laboratory, Madison, Wis.

MAY 20-21: Executives Conference, Institute of Paper Chemistry, Appleton, Wis.

MAY 20-22: Joint Spring Meeting, Pacific Section, TAPPI, Pacific Coast Div., APPMSA, Gearhart Hotel, Gearhart, Oregon.

MAY 23-25: Spring Meeting, National Paperboard Assn., Grove Park Inn, Asheville, N. C.

MAY 24-26: TAPPI Coating Conference, Poland Spring House, Poland Springs, Maine.

JUNE 14-17: Summer Meeting, Technical Section C.P.P.A., Empress Hotel, Victoria, B.C., Canada.

JUNE 21-23: National Meeting American Pulp and Paper Mill Superintendents Assn., Sheraton-Mount Royal Hotel, Montreal, Que.

PAPER TRADE JOURNAL

Published Weekly Since 1872

APRIL 30, 1954, *Vol. 138, No. 18*

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There is a Globe Starch to meet your every need.

TRENDS

PAPER TRADE JOURNAL

Buyer's Market Rivalry Develops Price Watering

Sharp competition for a share of the buyer's market is developing a fringe of weakness in the price of several commodities. Despite good business volume, prices are being inched downwards, in many instances as a maneuver to protect established accounts.

On the whole, producers are not discussing the price shading freely. They comment that prices were reduced to meet competition which was chiseling at the price structure.

Latest examples of such price watering are the 2½ percent cuts in "original equipment" tires; the $1 a ton reduction in steel in Detroit; and the one-half cent per pound cut in acetone.

Study in Semantics. From the consumer angle, the price shading adds up to "weakness", as salesmen sell on the basis of price.

Producers, on the other hond, hold there is no true element of weakness in the market. For these commodities, business is good; in some instances, it is excellent. They reduced their prices to an earlier level solely to resist competition in markets they had labored to develop, is the widely held view.

This reporter maintains that an orderly retreat to an earlier position does not necessarily constitute weakness. Of itself, it is a protective maneuver. But since price weakness could develop under further pressure, the trend is worth watching.

Defective Selling. Source of such price chiseling is laid to defects in salesmanship. Boom years are said to produce a generation of order-takers; salesmen have lost zest for the hard-won sale which comes from steady building and follow-through. They feel they must have *right price* in order to sell; and they permit themselves to be pressured into meeting price cuts and discounts.

Reflects Instability. Also a factor—and let's face it squarely—is a manifest amount of unstable thinking which is passed down to the salesmen from executives charged with getting a representative share of the receding market to keep the wheels of industry turning. Whether it amounts to a profitable operation or not appears to get little consideration.

Some gradual price adjustments are looked on as inevitable when the supply-potential of a buyer's market is greatly in excess of current demand, particularly so if the demand dip should be prolonged. Buyer price-resistance is a notably effective lever in such periods.

Whether prices dip or dive, however, will ultimately be determined by emotional stability. Where men have planned well for a keenly competitive market; where they have confidence in their product, in themselves and in the basic soundness of the national economy, 1954 will be a year of hard selling, good volume, and satisfactory profits.

Competitive Pricing Depresses Many Rag Contents

Rag content bonds, ledgers, index, (all grades except onionskin) are grouped with commodities influenced by competitive pricing. Many mills have cut prices one cent a pound to meet reductions made by a large midwest producer last December.

According to local merchants, the only *news* about this condition is that price announcements, effective May 1, now recognize what has been going on for some months. Where a sizable piece of business was involved, the mills have been quietly meeting the competitive price.

A few producers are resisting this price pressure by offering to protect floor stocks for 60 days. Two or three have not made known their decision pricewise.

Cuts Not Warranted By Costs and Demand, Mills Say

To the producer, these price adjustments are not in line with high costs of raw material and volume of demand. Though wood pulp prices are stable, new cotton cuttings are 1 to 1½ cents a pound higher than in December, 1953; other high costs are unchanged.

Consumer buying level is good; their stocks are healthy; order backlogs are fair; and the mills are operating at high ratio-to-capacity.

In all, producer spokesmen say they cannot operate profitably at the lower price level which is held to have been forced on them by competition. Nor do they recognize any element of price weakness in the picture, particularly so because the wholesaler has not felt the need for passing on to his accounts the price reductions he has received.

Confused Market, Say Merchants. On the other hand, merchants see real weakness and confusion in this competitive price chiseling. The mills are meeting price on any sizable order, they say; and though business is exceptionally good for fine paper houses, they see a threat to volume buying in any rash of price reductions.

Such are the prevailing winds of a competitive market.

N. Y. Printing Industry Is "Overwhelmingly Optimistic"

The great majority of printers and lithographers who make up New York's billion dollar printing industry are overwhelmingly optimistic about 1954's business conditions.

According to the results of a market study conducted by Henry Lindenmeyr & Sons, Div. of Hubbs Corp., New York, a substantial paper merchandising business that has weathered more than one storm, there aren't many pessimists among the 444 printers and lithographers probed.

Forty-one percent of those questioned predicted business will continue at the all-time high pace of 1953; 54 percent look to an even brighter future; only 5 percent expressed a dim view.

Comparing this year's business volume with 1953's, 16 percent of those cooperating said sales for the year's first quarter were ahead of 1953's period; 22 percent reported sales below year ago levels; 62 percent said business was keeping pace with 1953's. Among the 22 percent reporting sales lower than 1953's, only 13 percent held that business was "slow". The remainder described it as "fair". Shops reporting sales ahead of 1953 considered market conditions "brisk".

Fooey on the Gloom Forecasts. Net results of the customer-by-customer survey made by Lindenmeyr's own sales force indicate that the future of the printing industry looks increasingly bright. Backed by a hard-hitting selling team, it won't be satisfied in 1954 with less than the record peaks of 1953. "Fooey on the forecasters of doom and gloom", they say.

Bulky Waste Papers Reduced $2, $3 In Most Markets

As had been anticipated, the heavy supply of mixed paper, *news*, and old corrugated containers has depressed these grades in major markets. See Page 36 for f.o.b. shipping point prices.

—E.P.N.

Paperboard Production (Tons)*

	Apr. 17 1954	Apr. 10 1954	Apr. 18 1953
Production	242,332	242,753	252,496
New Orders	209,612	229,743	223,515
Unfilled Orders	378,774	413,245	523,178
% of Activity	91	89	96

* Source: National Paperboard Assn.

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NO NO NO NO NO NO NO
Silene® is not a filler!

Since Silene's introduction to the paper industry, there has been a tendency to refer to Silene as a "filler." This is not correct. Silene is not a filler!

Silene is an additive! It is a manufactured chemical produced under carefully controlled conditions. Silene is a development that has resulted from many years of research in one of the nation's leading chemical laboratories. The chemical name of Silene is calcium silicate.

Silene is not a filler! Silene exhibits an affinity for the pulp and thus assures exceptional retention in the paper-making process. Unlike inert minerals, Silene adds to the quality of the sheet through improving brightness, opacity and bulk . . . while bringing about substantial economies in paper production.

Use of Silene EF in some grades of paper has been established for several years. In addition, an extensive program of full mill-scale trial runs has proved additional economic applications.

For further information and experimental working samples, write today to Department S, the address below.

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WEEK OF PAPER TRADE JOURNAL APRIL 30, 1954

$575,000 Improvement Program Underway at Flambeau

Authorization has been granted and work is starting immediately in The Kansas City Star Co., Flambeau Paper Div., Park Falls, Wis. plant on the following.

Approximately 24,000 sq. ft. of floor space is being added to the finishing department by the addition of a two-story steel, concrete and brick addition, approximately 100 x 140 ft. This addition will be built out over the tail race of the mill flume, and, of course, be directly connected with the present finishing room facilities. C. R. Meyers & Co., Oshkosh, Wis., will be the construction firm handling this project.

In addition to this added building to the finishing department, the present walls between the machine department and the finishing department and shipping department will be removed so that this will be all one open room on the operating floor, the lower floors being utilized for storage purposes.

In addition to the finishing room, a new 84" Harris-Seybold Co. guillotine trimmer will be added. With this new trimmer, the company will have three 84" guillotine trimmers, one 72" and one 54".

In the loading room, present facilities for loading four carloads of paper will be doubled to enable the loading of eight carloads of paper at one time.

The Black-Clawson people were awarded a contract April 20 to furnish new pieces of equipment for the paper machines.

A new drum-type reel and winder of the most modern design will be added to both paper machines.

In addition, the No. 1 paper machine will have a size press and after dryers added to its manufacturing line, this also being furnished by Black-Clawson.

The new winders while being contracted for by Black-Clawson are Cameron machine winders.

The above improvements on which work is starting immediately will amount to approximately $575,000. The new finishing room is contemplated being finished by October 15. The size press and winders for the No. 1 machine will be shipped within a six months' period. The reel and winder for the No. 2 paper machine has been guaranteed to be shipped for installation during the 4th of July shutdown two-week vacation period so that there will be no lost production time in the installation of this equipment.

Columbia Cellulose Expansion Nears Completion

Additional equipment which was designed last year is now being installed in the new $27 million Columbia Cellulose pulp mill just south of Prince Rupert in British Columbia. It is claimed that this expansion, scheduled for early completion, will almost double production.

Alaska Juneau Still Interested in Alaskan Pulp Mill

The Alaska Juneau Gold Mining Co. now is free to engage in any type of business its directors consider likely to be profitable and the possibility of participating in pulp production in Alaska is still a live issue, according to C. A. Norris, president.

Action freeing the operations of the company was taken at a special meeting of stockholders amending the articles of incorporation which formerly restricted activity mainly to the mining and smelting of gold and other ores.

Mr. Norris indicated that Henry L. Gray, who undertook in 1952 to promote a pulp operation at Juneau, still is working on the plan and that his options have been extended. The company sees a possibility that after the beginning of operations at Ketchikan, where the Puget Sound Pulp & Timber Co. and the American Viscose Corp. are jointly about to start Alaska's first pulp mill, more interest in the development of Alaskan timber may be shown by other investors.

Federal Plans Further Expansion

The expansion program of the Federal Paper Board Co., Inc., is by no means completed, John R. Kennedy, president, told stockholders at the annual meeting.

"The changes that have been made in our set-up of properties and plants will be followed by such additional forward-looking steps as our best judgment suggests," Mr. Kennedy said. "We are constantly considering new properties and now have several prospects in view which we think will further strengthen the company and enhance its profit possibilities," he stated.

Pacific Defines Name Change

The name of Pacific Mills, Ltd. was changed to Crown Zellerbach Canada Ltd. effective April 22. However, there will be no change in the names of the following subsidiaries: Canadian Boxes Ltd., Northern Pulpwood Ltd., Badwater Towing Co. Ltd., and Hudson Paper Co. Ltd.

Wood Pulp May Yield Blood Pressure Remedy

According to *Science News Letter* chemicals from wood pulp and soy bean plants may be future medicines for patients with high blood pressure.

This appears from a report by Drs. Maurice M. Best, Edward J. Vanleon, Charles H. Duncan and Joan D. Wathen, all of the University of Louisville Medical School and the Veterans Administration Hospital, Louisville, Ky., at the meeting of the American Heart Assn. in Chicago.

These plant chemicals, the Louisville group found, lowered the amount of cholesterol in the blood of normal persons and of those who had abnormally high amounts of cholesterol in their blood.

Too much cholesterol is believed by some to play a role in hardening of the arteries and subsequent high blood pressure.

The plant chemicals are called sterols. They brought down the amount of cholesterol in the blood without any special diet being given to the patients. So far no toxic effects have been observed.

Three Men Suffocate In Digester

We think we should draw to our readers' attention an account of an accident which was recently described in the Swedish pulp and paper magazine.

In a Finnish mill a number of repairs were being carried on inside kraft mill digesters. The digesters were partially filled with chips to provide a working platform for the men. In the case of one digester the work was interrupted as welding repairs were being carried on above. The cover was placed over the digester to prevent sparks from entering and igniting the chips. This was on Saturday. On Monday, two workers removed the digester cover and descended inside to work. After ten or fifteen minutes another worker happened to look into the digester and saw the two men lying lifeless on top of the chips. He descended to help them and passed out also. A fourth man narrowly escaped a similar fate. A rescue crew with oxygen masks recovered the three victims but too late to restore them to life.

The investigation which followed showed that in a closed vessel after 48 hours practically all the oxygen is absorbed by the chips and there is a carbon dioxide. No poisonous gases can be detected. The spruce and pine chips absorb oxygen and give off carbon dioxide.

In an open digester there is ordinarily sufficient air movement to prevent the situation becoming serious, but in view of the above accident it is advisable to ventilate at all times a digester in which men are working on top of chips.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of United States paper production to mill capacity for the week ending April 17, 1954, was 94.3 percent, compared with 94.6 percent revised, for the preceding week. The ratio was 93.6 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending April 17, 1954, was 91 percent, compared with 89 percent for the preceding week, and 96 for the corresponding week last year.

(Detailed statistics on page 38).

Facts about our Industry

H. A. Buffard

Ice manufacturing for the cooling of sulphite acid . . . Evaporation of sulphite liquor . . . Condensing of sulphite digester smoke . . . Eight hour work shifts . . . Saturday afternoons off for office and laboratory workers, originated at Brown Co. (Burgess Mill) Berlin, N. H. in the late 1900's, (about 1905).

* * * *

The most advanced housing program was built in Rumford, Maine by Oxford Paper Co. . . . comprising about 125 brick houses with all modern conveniences; bath rooms, hard wood floors and wood work, finished basements with wash basins, furnaces, plus grass front lawns and back yards. All this about 70 years ago and today these homes are still up-to-date and well kept. Something for Oxford to be proud of . . . named Urquhart Park.

* * * *

Chillicothe, Ohio has more artesian water wells than any paper town in America and Mead Corp. (paper mill) uses more well water than any plant in the paper industry.

* * * *

The United States Paper Industry consumed more than 15 million tons of coal, 400 million gallons of fuel oil; 36,826,219,000 cu. ft. of natural and manufactured gas and buys over four billion kilowatts of electric energy per year.

* * * *

It is the third largest consumer of heavy chemicals which includes about 600,000 tons of salt cake yearly.

* * * *

The original stream-lined mill with ten machines under the same roof and on the same floor, with slush pulp pump straight to machines—no beaters—was at the Great Northern Paper Co., Millinocket, Maine. It manufactured newsprint and still is. It was built about 75 years ago.

* * * *

When the International Paper Co., Rumford, Maine installed the Flying Yankee paper machine running 750 ft. per minute on newsprint, visitors came from all over the world to see it start. (About 1908).

* * * *

Crossett Paper Mill's 210" machine was the first to run over 1400 ft. per minute on 40# kraft paper. (In 1941).

Safety in Our Industry

The safety record of our industry is not good. In fact compared with the results of other large industries with similar hazards we should be ashamed of ourselves.

We were interested to read the vice-president Al E. Brown of the International Brotherhood of Papermakers, A.F.L. told a group in Toronto, Ont. "When top management places as much importance on safety as it does on production the rate of industrial accidents begins to decline."

Let's be practical or go all the way! When labor unions begin to place as much importance on safety as they do on wages and other financial benefits, the drop in industrial accidents will be phenomenal.

Seriously, both mangement and labor in our industry must make greater efforts to improve accident records.

Paper Companies Win Advertising Awards

Two paper companies were among the award winners in the Associated Business Publication 1954 contest for advertising in industrial, institutional and professional magazines. Awards of merit were presented on April 23rd to the Fort Howard Co. and to International Paper Co., D. C. Cushman is advertising manager for Fort Howard Co. and Baker, Johnson and Dickinson (D. S. Plouff) are the advertising agency. The International Paper Co. advertising manager is Willard Von Hagan and the advertising agency is H. B. Humphry, Alley & Richards Inc. (H. L. Whittemore).

PAPER PEOPLE

R. Paradis

D. K. Kaslow

F. G. Williams

M&O Staff Moves

Three staff moves at the managerial level have been announced by Minnesota and Ontario Paper Co.

F. G. Williams has been promoted from assistant to the vice-president in charge of production stationed at International Falls to resident manager of Mando's newsprint and specialty mill at Fort Frances, Ont.; Donald K. Kaslow, from assistant comptroller, to assistant to the vice-president in charge of production at International Falls and Rodolphe Paradis, from assistant to the vice-president and general manager, at Fort Frances, to assistant to the resident manager at Kenora, Ontario.

Donald L. Eisenach has been appointed company safety officer stationed at International Falls, Minn. He replaces R. W. Croucher, who retired December 31 after 30 years of service.

Mr. Williams was first employed in 1934 at the Fort Frances mill. Three years later he transferred to the mill office. In 1949, he became chief mill accountant stationed at International Falls. In 1951, he was promoted to assistant to the vice-president in charge of production.

Mr. Kaslow joined Mando in 1937. He served in various accounting capacities until 1949. He then became assistant to the comptroller and in that capacity has headed financial reporting, cost accounting and budgetary controls.

Mr. Paradis became associated with Mando in 1953 after 17 years' experience in the pulp and paper industry in the United States and Canada.

Robert Gair Elects Caddoo

Robert Gair Co., Inc., New York, have re-elected the board of directors, and elected William H. Caddoo as vice-president in charge of boxboard operations.

Norman F. Greenway and Raymond F. DeVoe, vice-presidents, were elected senior vice-presidents. The rest of the officers were re-elected.

Mr. Caddoo joined the company in 1933. He served as technical director, manager of the company's Thames River, Conn., plant and assistant to the vice-president in charge of boxboard operations.

Herman Whitmore, who has been with the company 34 years, and vice-president in charge of boxboard operations for more than 7 years, recently found it necessary for reasons of health to move to the West Coast. He will continue with the company with somewhat restricted activities.

Changes at Rayonier

Rayonier has announced the following changes:

Carson L. Christian has been transferred to Jesup as machine room superintendent. He came to Rayonier in 1939 as an oiler.

C. C. Rippberger has been appointed Shift Superintendent at Jesup. He joined Rayonier in 1939.

W. A. Robinson has been named a Shift Superintendent at Jesup.

Mr. Robinson joined Rayonier's staff in 1939 as superintendent of the water plant.

Dull Named Chief Engr. Of Ottawa River

Robert J. Dull, has been named to the newly created post of chief engineer of the Ottawa River Paper Co.

Mr. Dull was staff assistant to Phillip LeBoutillier Jr., president, since September, 1953.

Dixie Cup Elects Currie

T. D. Currie, M.B.E., has been elected vice-president and general sales manager of Dixie Cup Co. (Canada) Ltd., Brampton, Ont. A. G. Malone, recently Canadian sales manager, has been transferred to the headquarters plant of the company at Easton, Pa., as national field sales manager for the Eastern regions of the United States.

Sisson Named Chief Engr. At Sorg

Irving D. Sisson has been appointed chief engineer of The Sorg Paper Co., Middletown, Ohio. This is a new position which has been established to coordinate all engineering activities.

Mr. Sisson, was with the St. Joe Paper Co. in Port St. Joe, Fla., prior to becoming associated with the Sorg organization last October.

E. L. Lamb

J. O. Burton

W. H. McPherson, Jr.

M&O Promotes Production Research Personnel

Minnesota and Ontario Paper Co. has made the following production-research personnel promotions: E. L. Lamb, formerly assistant director of research in charge of pulp, paper and by-products has been named production assistant to the executive vice-president with headquarters at the main office in Minneapolis; Dr. John O. Burton, formerly research laboratory manager, to assistant director of research in charge of pulp, paper and by-products; Dr. William H. McPherson, Jr., formerly supervisor of paper research, to manager of the research laboratory, and Cecil L. Hess, formerly supervisor of pulp and by-product research, to supervisor of pulp, paper and by-products research.

In his new position, Mr. Lamb will function in a coordinating and planning capacity, especially in relation to the production, engineering and research divisions of the company. Mr. Lamb joined Mando in 1953 coming from the Oxford Paper Co., Rumford, Maine, where he was director of research. He had previously held various operating and technical positions with the West Virginia Pulp and Paper Co. and The Scott Paper Co.

Dr. Burton became associated with Mando in 1937 as a research chemist and has been in charge of the research laboratory at International Falls, Minn., since 1942. In his new position, he will headquarter in Minneapolis and will be responsible for the improvement of existing paper grades and the development of new paper products.

Dr. McPherson, Jr., joined Mando in 1952 as supervisor of paper research. As research laboratory manager he will be responsible for the direction of all research activities at the laboratory and research activities in conjunction with production and operations.

Dr. Hess became a member of the International Falls research staff in 1951. From 1951 to 1952, he was on military leave of absence. Upon his return to Mando, he became supervisor of pulp and by-product research. His present position is expanded to included supervision of all paper research.

Boutelle Manages Gardner's Lockland Mill

Gardner Board and Carton Co., Middletown and Lockland, Ohio, has appointed Clifton P. Boutelle to general superintendent of its paperboard mill in Lockland.

Mr. Boutelle joined Gardner in 1953 as a member of the operations management organization. Before that he was coating mill manager for the Alliance Paper Co. of Georgetown, Ontario. Previously, he had been assistant to the superintendent of the S. D. Warren Paper Co. of Cumberland, Maine.

Gardner has also appointed Lars H. Sjodahl to the position of technical supervisor of its Middletown carton plant.

Before coming to Gardner, Sjodahl was a chemist with the Interchemical Corp., Chicago, Ill. Before that he was a chemist and printing specialist with the Curtis Publishing Co. of Philadelphia, Pa.

Bennett Joins Schweitzer

William T. Bennett has been named assistant manager of the Eagle Mill, Smith Paper Division, Peter J. Schweitzer, Inc., Lee, Mass.

Mr. Bennett was previously employed by the West Virginia Pulp & Paper Co.; the P. H. Glatfelter Paper Co. of Spring Grove, Pa.; and the Halifax Paper Co. of Roanoke Rapids, N. C. He joined the Schweitzer organization about two weeks ago.

Shaler Named Asst. Paper Mill Supt. at Scott

John Shaler has been appointed to the newly created position of assistant paper mill superintendent of Scott Paper Co., Chester, Pa.

The following personnel changes were also announced: Charles Gladeck has been named paper mill maintenance supervisor. He joined Scott in 1922 and is a member of the 25-Year Club.

Clarence Raker becomes supervisor of paper mill mechanics. He has been employed by Scott since 1944.

William Krause has been made finishing maintenance manager. He was formerly in plant engineering.

S. Elvin Lloyd has been promoted to assistant master mechanic.

Clarence Leflar has been made maintenance expediter in the maintenance planning department.

Nat. Container Names Two V.-P.'s

Carlton F. Diskin and Samuel D. Bass have been elected vice-presidents of National Container Corp.

Mr. Diskin, a Baltimore attorney, was formerly assistant to the president. He joined National two years ago, prior to which time he was Assistant Chief Counsel of the Forest Products Division of O.P.S.

Mr. Bass, a New York attorney and C.P.A., was formerly comptroller of National Container, having joined the company seven years ago.

National also announced the election of Arnold Ginsberg as an Assistant Vice-President.

Throckmorton Elected Fibre Board Director

Charles W. Throckmorton, Jr., for several years a vice-president, has been elected a director of the Fiber Board Container Corp., Richmond, Va., to succeed Anthony J. Bagley.

Thomas J. Bourne, Jr., Richmond director, was elected a vice-president of the firm. All other officers were re-elected.

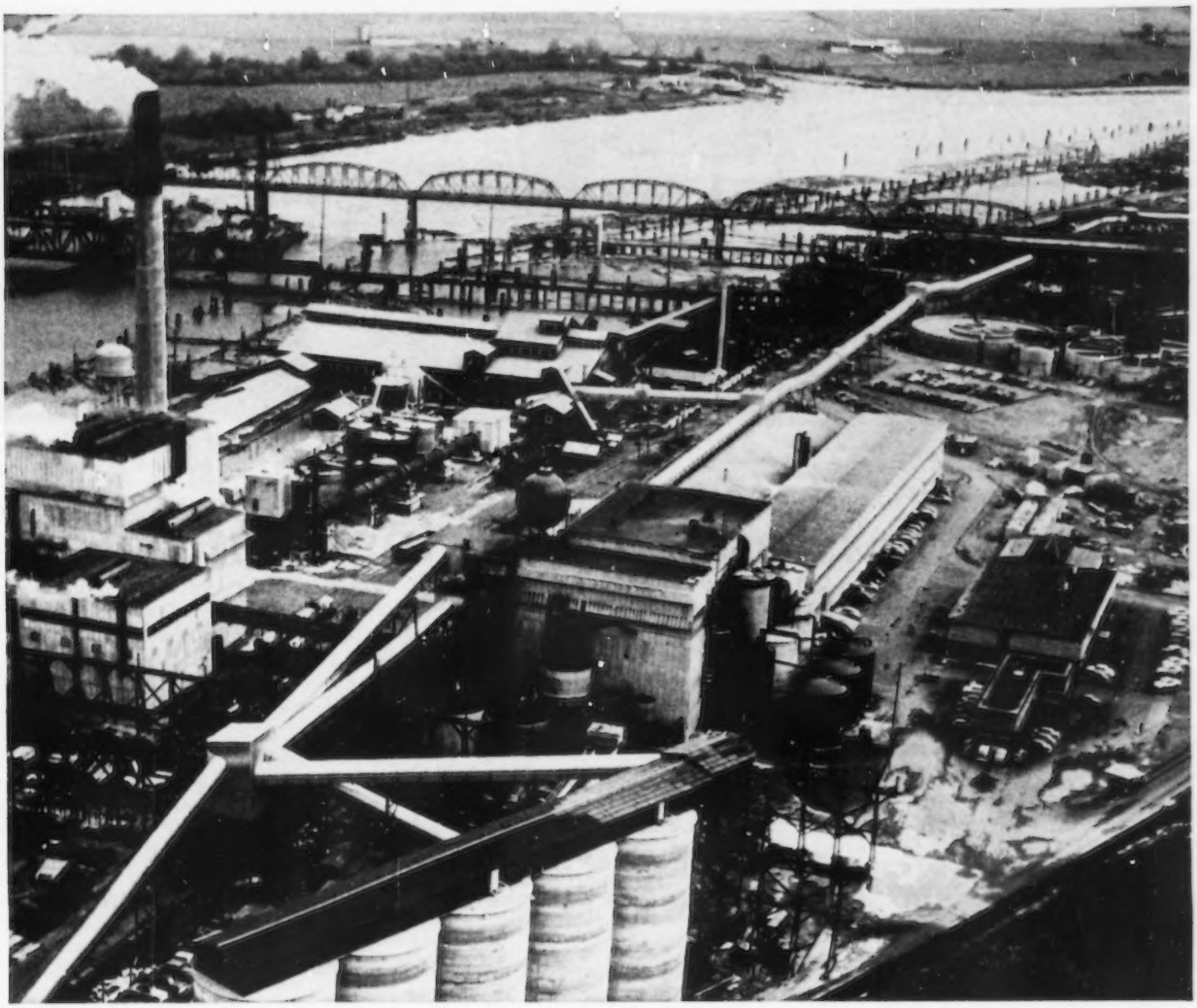
Fibre Board Container Corp. operates corrugated shipping container plants in Richmond and Martinsville, Va., and is a wholly owned subsidiary of Robert Gair Co., Inc., of New York.

Sauer and Myers Handle Purchasing For Container Corp.

Frank J. Sauer has been named vice-president in charge of general purchasing of Container Corp. of America. Norman C. Myers was named director of purchases simultaneously.

Rhinelander Moves New York Office

The New York office of the Rhinelander Paper Co., Rhinelander, Wis., has moved to new and larger quarters. After May first its sales staff will be located at 500 Fifth Avenue, New York 36, N. Y. It was formerly headquartered at 141 Broadway.



Hungry paper mill fed by longest conveyor belt system of its kind... *all U. S. Rubber belts*

In keeping with its progressive management, this paper mill* located in the State of Washington and one of the world's largest, has consistently modernized and cut operating costs. Latest advancement is this great conveyor belt system which carries 250 tons of wood chips per hour.

This belt system, traveling one and a quarter miles—(the longest ever installed in a paper mill) utilizes two and a half miles of 36" wide U. S. Giant® Conveyor Belting specifically designed for operation over 45-degree troughing idlers. The belting was designed, and built, by United States Rubber Company through *Three-Way-Engineering*—in which "U. S." engineers work hand in hand with engineers representing the mill officials and those representing the designers of the conveyor equipment. This mammoth belt system loops under the Pacific Coast's main highway (No. 99) and over three transcontinental railroad lines. Its savings in time and money are almost impossible to calculate.

This paper mill also uses many other "U. S." products to deliver economy and efficiency in its manufacturing process. These include V-belts, expansion joints, pinch valves, rubber mountings, plastic pipes, hose and mattings. Everywhere you go in industrial America, you will find "U. S." serving the manufacturer. 26 District Sales Offices are strategically located—each staffed with engineers ready at all times to help you. There is also a nationwide chain of "U. S." distributors. Or write to address below.

**Owned by Weyerhaeuser Timber Co.*

"U.S." Research perfects it..."U.S." Production builds it... U.S. Industry depends on it

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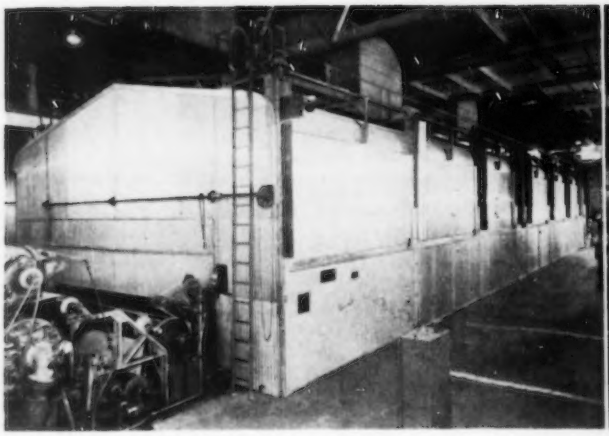
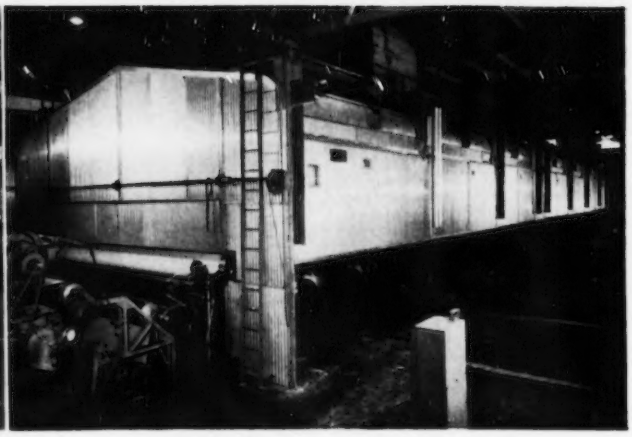
Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting



ROSS HOOD fully closed.



FRONT LIFTING PANEL in open position.

Report on Closed Hood Installations at Iroquois Falls

J. C. Jordan
Engineer, Abitibi Power & Paper Co., Ltd.

This extremely interesting development by Ross Engineering Co., shows promise of being one of the most important paper machine developments in many years. A number of units are now on order for installation in this country.

Abstract

This paper reports on three closed hood installations on newsprint machines after one year of successful operation.

Completely enclosing the dryer section and installing felt supply systems, new Grewin systems, and economizers has:

1. *Reduced steam consumption per ton for paper.*
2. *Permitted an increase in production by increasing the drying rate;*
3. *Recovered heat in room supply air, felt supply air, and process water;*
4. *Reduced the pounds of air necessary to convey the moisture removed from the paper;*
5. *Improved working conditions in the machine room;*
6. *Provided equipment on which experiments can be run to improve operating efficiency and reduce capital expenditures for paper machine installations.*

Introduction

One of the greatest unknowns at the time of the installations was whether the closed hoods would be run as closed hoods. To take care of any eventuality, the fans, ducts, and heating coils were sized to handle the large amount of air which would be necessary for open hood operation. Fortunately, from the day they were installed, each hood has been run completely closed. The provision for open hood operation has been proven to be unnecessary, and it is safe to assume that a future closed hood installation could be designed for closed hood operation only.

General Operating Data

The previous papers (1, 2) on these installations have described the equipment in detail; however, for the sake of review, Fig. 1 has been included to show the air flow and installed fan capacity for closed hood operation on No. 7 paper machine. Exhaust from

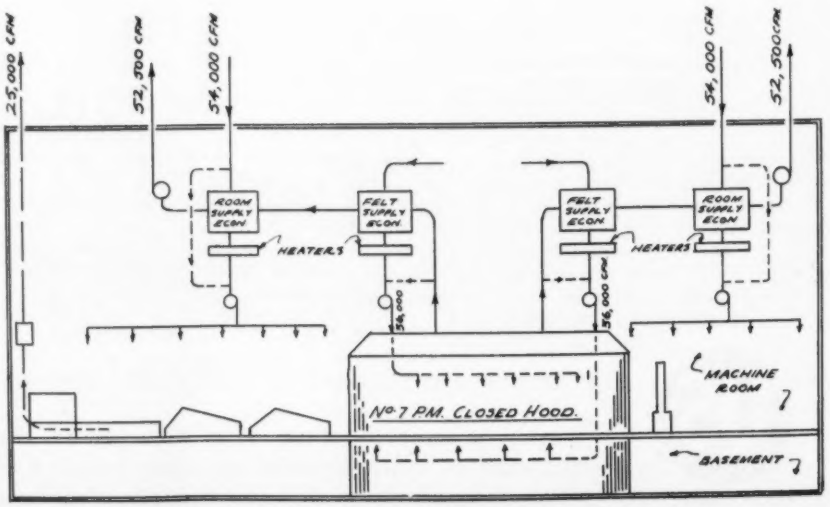


FIGURE 1. AIR FLOW — No. 7 paper machine, closed hood operation.

each stack passes through two economizers. The air blown onto the felts has the first chance to recover heat from the exhaust which it does in the felt supply economizer. Heating coils were installed to add more heat to the felt supply air, but are seldom used. It has been found that felt air temperatures of approximately 136 deg. F. dry bulb and 108 deg. F. wet bulb are sufficient for good operation and these temperatures can be obtained by recovery of heat in the economizer and some recirculation of hood exhaust.

Air for the felt systems is drawn from the truss area above the machines. This air is hot and moist and by changing it continuously, the concentration of moisture is reduced and the heat recovered.

Air for room supply is heated in the second economizer. Heating coils were installed to heat the mill during non-operating days and in periods of extremely cold weather. Under normal operating conditions, and with outdoor conditions as low as —30 deg. F., air is heated in the economizer to approximately 80 deg. F. without the necessity of adding heat with the steam coils.

Water is sprayed in the path of the exhaust and, after it has picked up heat, is filtered in a North rotary filter to remove the lint. It is then pumped to showers on the Bird screens, head boxes, and presser rolls. Since the value of heated water for paper machine showers is still somewhat in doubt, heat to air should be the first consideration, and water can be heated with the remaining available heat in the exhaust.

Discussion

(a) Reduced Steam Consumption Per Ton of Paper

Several performance tests were made on the enclosed dryer sections of the three machines to determine the efficiency of the installations. Samples of the sheet were taken after the second press and at the reel to determine the average moisture content of the sheet entering and leaving the dryer section. Steam to the dryers was metered and the heat in the condensate returned to the steam plant was subtracted from the heat in the input steam to obtain the steam rate which was converted to "From and At" pounds per hour. Pitot tube traverses were made at the exhaust fan outlets to determine the quantity of exhaust. The width of sheet was measured at the reel and the tests were run at continuous operation or 100 per cent efficiency. No allowance was made for overdrying the sheet and adding moisture with the sweat dryer.

Table 1 shows the results of all tests taken on Nos. 5, 6, 7, and 3 paper machines. Two performance tests were run on No. 7 paper machine prior to the installation of the closed hood. One test on No. 3 paper machine, which is a duplicate of No. 5, was made to compare the operation of this open hood machine with closed hood operation on No. 5.

A comparison of the test figures of No. 7 paper machine as recorded in Table 1 shows, that with an open hood, an average of 1.635 lb. of steam was required to evaporate one pound of water in the dryer section, and that with a closed hood, the pounds of steam per pound of water were reduced to an average of 1.305. This is a reduction of .33 lb. of steam per lb. of water required. The rate of 1.305, if used in test No. 1 would reduce the steam per ton of paper to (1.94 x 1.305 x 2000) 5,080 lb. per ton, a reduction of 1,400 lb./ton. The figures for pounds of water evaporated per pound of paper dried increased with the increase of machine speed. Pressing was poorer at higher speeds and more water had to be evaporated in the dryer section for each pound of paper dried.

The tests for No. 5 paper machine as shown in Table 1, give an average figure of 1.29 for pounds of steam per pound of water evaporated. One test on No. 5 paper machine, the open hood equivalent of No. 5 with 4 fewer paper dryers gave a figure of 1.54, which is a low rate for open hood operation without a good Grewin system. Applying the closed hood rate from No. 5 to No. 3 machine, (2.13 x 1.29 x 2000) steam per ton of paper is reduced 1,010 lb./ton, from 6,560 lb. to 5,500 lb.

It is evident from the results in Table 1 that "lb. of steam/ton of paper" cannot be used as a figure to compare drying efficiencies of paper machines, without a knowledge of the moisture in the

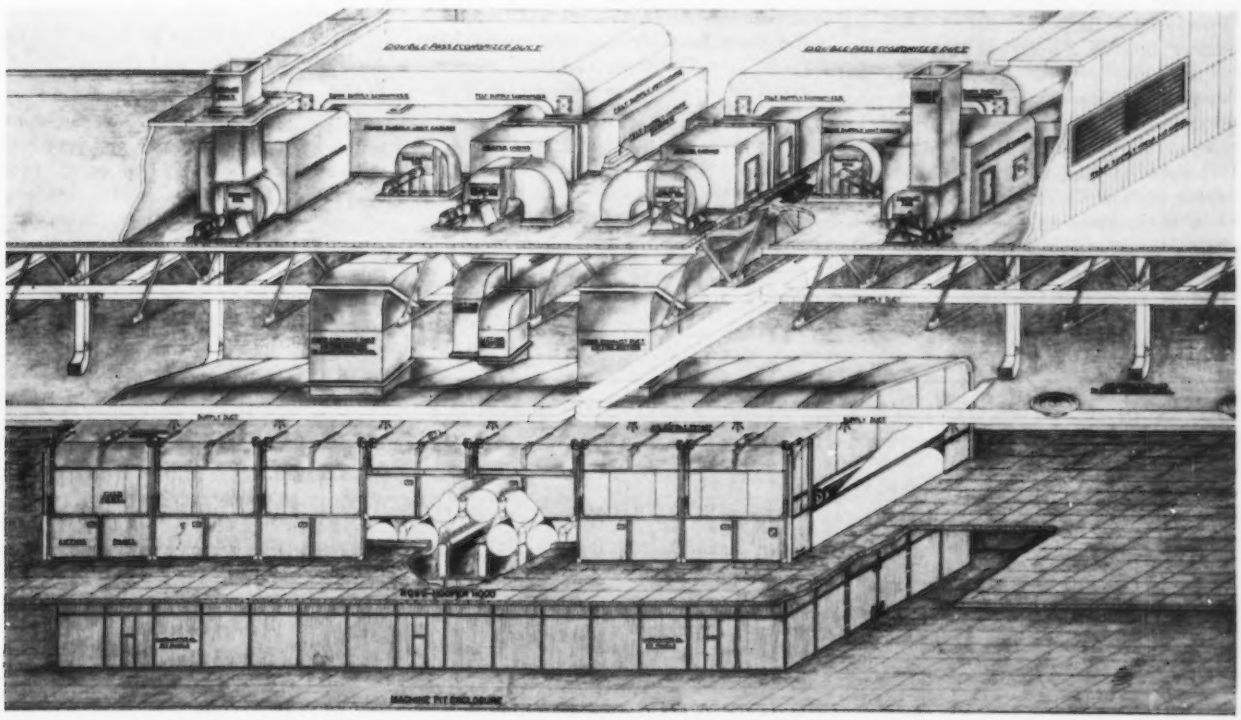


FIGURE 2. DETAILS OF LAYOUT of paper machine ventilating equipment.

TABLE I

SUMMARY OF PERFORMANCE TESTS

Test No.	Date	Machine No.	Speed f.p.m.	Dryer Pressure p.s.i.g.	Lb. H_2O Evaporated /Lb. Paper	Lb. H_2O Evaporated /Min.	Tons Paper /Day Continuous Production	Metered Steam/ Ton Paper Lb. F.&A.	Lb. Steam /Lb. of Water Evaporated
1	13 Oct. 1952	7*	950	18.5	1.94	348	128.8	6,480	1.67
2	14 Oct. 1952	7*	947	18.25	1.925	355	133.0	6,150	1.60
3	14 Oct. 1953	7	1264	21.0	2.07	512	178.0	5,460	1.32
4	15 Oct. 1953	7	1263	24.0	2.13	524	178.0	5,620	1.32
5	15 Oct. 1953	7	1263	22.5	2.10	525	180.0	5,460	1.30
6	30 Nov. 1953	7	1260	18.5	2.12	519	176.5	5,400	1.28
7	3 Dec. 1952	6	1215	17.5	2.03	476	169.0	5,450	1.34
8	14 Oct. 1952	5	1201	15.0	2.09	332	114.2	5,560	1.33
9	16 Oct. 1952	5	1214	16.0	2.09	332	114.8	5,470	1.31
10	6 Nov. 1952	5	1217	18.5	2.12	336	114.6	5,600	1.32
11	6 Nov. 1952	5	1217	19.0	2.07	333	116.0	5,640	1.36
12	10 Nov. 1952	5	1215	18.0	2.09	336	115.3	5,740	1.37
13	15 Oct. 1953	5	1233	14.0	1.885	298	114.0	4,620	1.23
14	19 Nov. 1953	5	1222	13.0	1.845	288	112.2	4,040	1.10
15	19 Nov. 1953	3*	943	17.0	2.13	259	87.6	6,560	1.54

* Test with Open Hood and No Economizers.

sheet, entering and leaving the dryer section.

A reduction in the amount of steam to evaporate one pound of water by as much as $\frac{(1.635 - 1.305) \times 100}{1.635}$ or 20 per cent is a steam saving which we did not expect to realize with the installations, and represents a considerable decrease in total steam to a paper machine, which evaporates 520 lb. of water per minute.

(b) Increase of Production and Drying Rate

Table 2 shows the number of dryers installed on the three closed hood machines and No. 3 machine. A comparison of the averages for closed hoods and open hoods shows that the water evaporation rate has increased on the enclosed dryers by 18.0 per cent which represents a considerable increase in the dryer section water evaporation rate.

A comparison of the test figures for No. 7 paper machine with an open and closed hood shows that the water evaporation rate in lb./hr./sq. ft. of dryer surface has increased (.49 × 100)/2.32 or 21.1 per cent.

No. 7 with open hood, water evaporated in dryer section ..... = 351.5 × 60 = 21,090 lb./hr.

Area of dryer surface ..... 9,076 sq. ft.

No. 7 with closed hood, water evaporated in dryer section ..... = 520 × 60 = 31,200 lb./hr.

Area of dryer surface ..... 11,114 sq. ft.

To evaporate 31,200 lb./hr. at the open hood rate, dryer surface necessary ..... (9076 × 520)/351.5 = 13,450 sq. ft.

Six—60 in. diam. paper dryers were installed with the closed hood, to increase the total square feet of dryer surface to 11,134 sq. ft. To maintain the open hood drying rate would have required $\frac{(13,450 - 11,114)}{288}$ = 8 additional 60 in. diam. dryers.

These figures are given only to illustrate the increased drying rate on No. 7 paper machine and should not be used as a basis for design.

So far the highest speed attained on No. 7 machine has been 1293 f.p.m. with a dryer pressure of 24 p.s.i.g., and a moisture of 71 per cent leaving the second press. This is good performance on a machine with 35—60 in. diam. paper dryers, 1—60 in. diam. sweat dryer, 1—30 in. diam. baby dryer and 4—48 in. diam. felt dryers.

E. and B. Cowan (3) in Table 2 of their "Theory of Paper Drying", published in 1937, give for a speed of 1,170 f.p.m., 43-60 in. diam. paper dryers as the ideal number, with 10 p.s.i.g. dryer pressure and 72 per cent moisture entering. Our No. 5 machine, with 34-60 in. diam. dryers, running at 1,222 f.p.m. and 13.0 p.s.i.g. also indicates good performance.

(c) Recovery of Heat in Room Supply Air, Felt Supply Air and Process Water

Tables 3 and 4 show performance tests of No. 7 machine to compare heat recovery with closed and open hood operation. The dryer steam pressures are the same for both tests, though the closed hood machine is running 33 per cent faster and evaporating 46.2 per cent more water.

TABLE II

PHYSICAL DATA AND DRYING RATES — Nos. 3, 5, and 7 PAPER MACHINES

Machine No.	Width and Make	Speed f.p.m.	No. Paper Dryers	No. Felt Dryers	Average Sheet Width	Sq. Ft. Dryer Surface	Lb. Water Evap./Sq. Ft. Dryer Surface
7*	Walmsley 234″	950	29—60″ 1—30″	3—48″	217.25″	9,076	2.32
7	Walmsley 234″	1260—1264	35—60″ 1—30″	4—48″	219.30″	11,114	2.81
3*	Pusey & Jones 156″	943	28—60″ 1—24″	2—48″ 1—60″ intervening	145.25″	5,896	2.57
5	Pusey & Jones 156″	1201—1233	33—60″ 1—30″	4—48″ 1—48″ intervening	145.6″	7,164	2.70

*Open Hood.

NOTE—Sq. ft. of dryer surface includes area of felt dryers but does not include area of sweat dryer.

In the open hood test, 690,000 B.t.u./min. were exhausted to the roof with no heat recovery. In the closed hood test 831,000 B.t.u./min. left the hood but only 530,000 B.t.u./min. escaped to the roof since 301,000 B.t.u./min. were recovered in room supply air, felt supply air, and heated water.

To draw a closer comparison of heat loss and recovery we can say that in the open hood test, $\frac{690,000}{355} = 1,940$ B.t.u. were lost for each pound of water evaporated and in the closed hood test, $\frac{530,000}{519} = 1,020$ B.t.u. were lost, showing that the loss has been reduced by 47.5 per cent with closed hood operation.

Of the 301,000 B.t.u./min. recovered, 97,000 B.t.u. or 32 per cent went to heat room supply air, 17,400 B.t.u. or 6 per cent heated felt supply air and the remaining 186,600 B.t.u./min. or 62 per cent was recovered in the shower water.

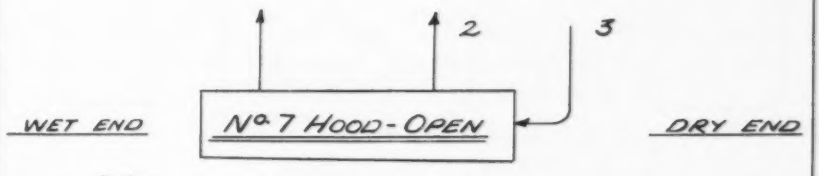
Last winter with an outdoor temperature of —30 deg. F., 108,000 c.f.m. of room supply air were heated 105 deg. F. to 75 deg. F. by the economizers only. At the same time, felt air was heated without steam in the felt heating coils, and the remaining available heat was recovered in water. Heating this amount of room supply air represents a steam saving of 12,600 lb./hr. of F. & A. steam on one paper machine, and does not include heat to felt air and water. The peak demand for coal-generated heat from the steam plant would be reduced considerably by economizers on all seven machines.

We have been able to operate our closed hood dryer sections with high dry and wet bulb exhaust temperatures, as shown in Table 4, without making the room conditions uncomfortable for the operators. High exhaust temperatures permit a good transfer of heat and recovery in the economizers. The temperatures shown on the psychometric chart, Fig. 3, are for the dry end exhaust in test No. 4, Table 1, and are the highest at which we have tried to operate.

From points (1) to (2) on Fig. 3, 61.5 B.t.u. per lb. of air were removed in the felt supply economizer to heat felt air and water. From points (2) to (3) 28 B.t.u. per lb. of air were removed in the room supply economizer to heat room air and water. Point (4) shows the conditions for the wet end exhaust for the open hood test in Table 3, and by coincidence this exhaust has the same heat content as the exhaust from No. 7 dry end system after 89.5 B.t.u./lb. had been removed in the economizers.

TABLE 3

DIAGRAM



Data \ Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D.B. °F.	125	134	38													
W.B. °F.	119	121	36													
D.P. °F.	118	120	33													
R.H. %	80	63	80													
T.H./Lb. Dry Air	115	122	13.5													
Gr./Lb. Dry Air	535	560	28													
Gr./Cu. ft.																
Cu. ft./Lb. Dry Air	16.55	16.85	12.62													
C.f.m. in 1000	51.5	45.6														
Lb. Dry Air/Min.	3120	2710	5830													
T.H. B.t.u./Min. in 1000	360	330														
Lb. H_2O/Min.	239	217														

Width of Reel = 217.25 Speed Ft./Min. = 947 Basis Wt. of Sheet = 32.25

Production Rate = $\frac{217.25 \times 947 \times 12 \times 32.25}{24 \times 36 \times 500}$ = 184.5 lb./min. or 11,050 lb./hr = 133 tons/24 hr

Sheet entering dryer section = 31.4% Sheet leaving dryers = 91.9%

Lb. Water evaporated/lb. paper dried = $\frac{91.9}{31.4} - 1 = 1.925$

Lb. water evaporated in dryer section/min.	355 lb.	
Lb. water in air being exhausted/min.	456	2nd Press
Lb. water in equivalent outdoor air	23.4	
Total pick up lb./min.	432.6	
Pick up from other sources lb./min.	432.6 − 355 = 77.6 lb. = 21.9%	
Total heat in exhaust air B.t.u./min.	690,000	
Total heat in supply air B.t.u./min.	160,250	
Total heat added B.t.u./min	529,750	

Rate of steam flow to dryers lb./hr. = $\frac{529,750 \times 60}{970.3}$ = 32,750 lb. F. & A. 212° or 546 lb./min.

From test, lb. steam/lb. of H_2O evap. in dryers = $\frac{32,750}{355 \times 60}$ = 1.54 lb. Steam/ton paper = 5925 lb.

From steam flow, lb. steam/lb. H_2O evap. in dryers = $\frac{34,050}{355 \times 60}$ = 1.60 Steam/ton paper—6150 lb. Steam press, 18.25 p.s.i.g.

Figure 4 is a graphical representation of the distribution of recovered heat to room supply air, felt supply air, and water, for the average monthly temperatures recorded at Iroquois Falls in 1951. The recovery rate of 18,300 lb./hr. is a conservative figure based on test results, and represents approximately 45 per cent of the total steam to the dryer section. 108,000 c.f.m. of room supply air is heated from outdoor temperature to 80 deg. F. and the chart shows that heat is recovered for the whole year.

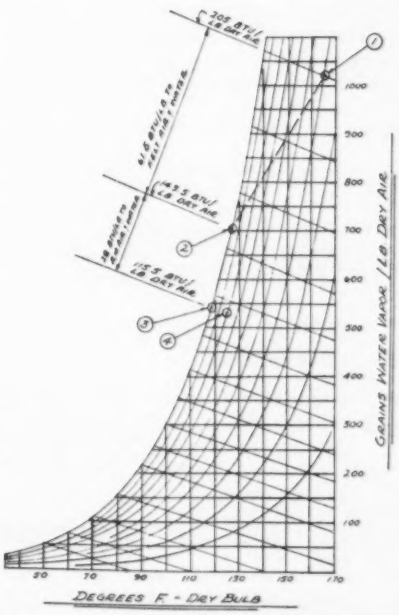


FIGURE 3. PSYCHOMETRIC CHART showing heat recovery in closed hood operation.

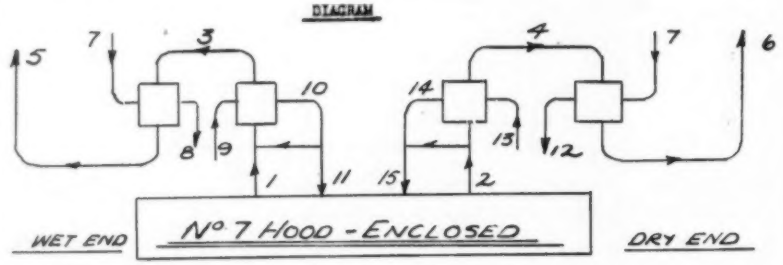
Air for felt supply is taken from the truss area above the machines, where the temperature is approximately 95 deg. F., and heated to an average temperature of 121 deg. F. by the felt supply economizer. A certain amount of felt supply air is recirculated exhaust from the hood which increases the felt air temperature. The amount of recirculation is fairly constant and the same quantity of fresh felt supply air is drawn from the truss area continuously. The average amount handled by both felt supply fans on No. 7 machine is 48,000 c.f.m. The heat recovery rate, 24 hours per day, 309 days per year is $\frac{42,800 \times (121°F - 95°F) \times 1.085}{970.3} =$ 1,240 lb. of steam/hr. F. & A.

(d) Reduced Pounds of Air Per Pound of Paper

In the past year we have been able to dry paper on No. 7 paper machine with approximately 20 lb. of air per lb. of paper. To do this, both exhaust fans consumed a total of 29 h.p. No. 7 hood is peculiar in that, to keep the temperature of the wet end exhaust at a desirable level, it is necessary to run

TABLE 4

DIAGRAM



Data	Station 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D.B. °F.	159	166	123	126	115	113	32	84	95	113	150	79	95	111.5	150	
W.B. °F.	127	133	123	126	115	113	32	58	75	96	104	59	75	82	107.5	
D.P. °F.	123.9	130.5	123	126	115	113	32	32	67	92.5	95.7	44	67	72.5	100.5	
R.H. %	32	31	100	100	100	100	100	17	39	52	18	29	39	27	21	
T.H. /lb. dry air	143.3	168.8	129	139.5	104.7	99.2	11.5	25.1	38.8	64.8	79	26	38.8	45.9	86.5	
Gr. /lb. dry air	640	790	627	683	485	455	26.1	30	100	237	263	43	100	120	318	
Gr./cu. ft.																
Cu. ft. /lb. dry air	17.8	18.25	16.77	17.06	16.09	15.94		13.8	14.29	15.2	16.26	13.7	14.29	14.78	16.41	
C.f.m. in 1000	36.1	59.4			32.6	51.1										
Lb. dry air/min.	2025	3205			2025	3205										
T.H. B.t.u./min. in 1000	290	541			212	318										
Lb. H_2O/min.	185	362														

Width of reel = 218.5 . Speed ft./min. = 1260 Basis wt. of sheet = 32.0

Production Rate = 215 lb./min. or 14,700 lb./hr. or 176.5 tons/24 hr.

Sheet entering dryer section = 29.7% o.d. Sheet leaving dryers = 7.3% or 92.7% o.d.

Lb. water evaporated/lb. paper dried ..... $\frac{92.7}{29.7} - 1 = 2.12$

Lb. water evaporated in dryer section/min. 519

Lb. water in air being exhausted/min. 547

Lb. water in equivalent outdoor air 19.5

Total pick up lb./min. 527.5

Pick up from other sources lb./min. ..... 8.5 or $\frac{8.5}{519} \times 100 = 1.64\%$

Total heat in exhaust air B.t.u./min. 831,000

Total heat in supply air B.t.u./min. 303,800

Total heat added B.t.u./min ..... 527,200 + (47,000 from felt heaters).

Rate of steam flow to dryers lb./hr. = $\frac{574,200 \times 60}{970.3} = 35,403$ lb./hr. F. & A. 212° or 590 lb./min.

From test, lb. steam/lb. H_2O evap. in dryers = $\frac{590}{519} = 1.135$ lb Steam/ton paper = 4820

From steam flow, lb. steam/lb. H_2O evap. in dryers = $\frac{1}{.785} = 1.275$ lb. Steam/ton paper = 5400

Steam press. = 18.5 p.s.i.g.

Grewin temp. 8 oz. 172°F.

NOTE — In this test on bottom D.E. felt dryer — no steam; Recirculations — 4 lb. on both gauges — 21.35 lb. air/lb. paper.

the wet end exhaust fan approximately 100 r.p.m. slower than the dry end. Consequently, the dry end fan uses 20 h.p. while the wet end fan uses 9 h.p.

On No. 5 machine, where we have had trouble with the dry end rectifying unit, the wet end exhaust fan has been running at 510 r.p.m. and the dry end exhaust at 180 r.p.m. Horsepower consumption was 19.5 and 1.33 respectively. These results are from test No. 13, Table 1, where 26 lb. of air per lb. of paper were used for drying. Other tests on No. 5 showed that 18.8 lb. of air per pound of paper gave satisfactory results.

Tests on No. 3 and No. 7 open hoods showed that 39 lb. of air were required in No. 3 and 33 lb. in No. 7 for each pound of paper dried.

A comparison of No. 7 machine open and closed hood operation showed that $\frac{33-20}{33} \times 100 = 39.4$ per cent more air per pound of paper was required when operating with an open hood. The open hood tests on No. 7 also indicated that the exhaust dry and wet bulb temperatures were too high to maintain good room conditions and more air should have been supplied to dry the paper.

If No. 7 machine had remained an open hood at 1,260 f.p.m. it would have been necessary to supply approximately 66,000 c.f.m. more air for exhaust. Heating this air from outdoor temperatures to at least 75 deg. F. before it entered the machine room, would have required the use of live steam at the hourly rates shown at the top of the graph in Fig. 4.

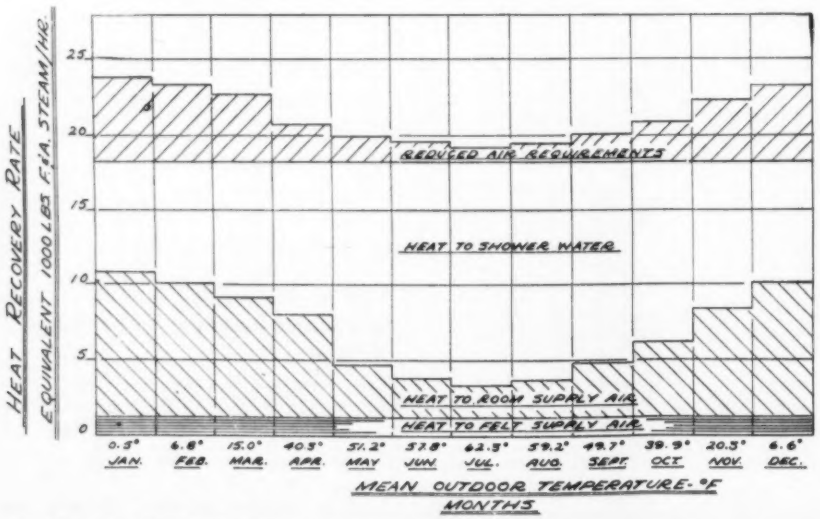


FIGURE 4. DISTRIBUTION OF RECOVERED HEAT to room supply air, felt air and water.

(e) Improved Working Conditions in the Machine Room

Several tests were taken during the summer to determine the benefits from machine room ventilation, and the results showed that conditions had improved to a point where it was possible to operate the machines in comfort. Grilles had been placed to discharge where the men work, and the velocity and the lower temperature air had lowered the effective temperatures.

An advantage of closed hood operations has been the elimination of radiant heat from the ends of the dryers. The comfort obtained has been particularly noticeable in the tending aisle between Nos. 6 and 7 machines, where the operators have previously been subject to the radiant heat from both dryer sections.

(f) Miscellaneous Experiments to Improve Efficiency

One of the advantages of the closed hood installations is the extreme flexibility of operation, which permits adjustments for more economical operation and experimentation to improve the design of future paper machine dryer sections.

Recently, the two 48 in. diam. dry end felt dryers on No. 6 machine were shut off in an attempt to improve the moisture distribution of the sheet at the reel. The test results indicated that the sheet uniformity had increased and that the dry end felt dryers were not necessary on this machine, since the flow of hot felt air to the dry end felts is sufficient to remove moisture from the felts without assistance from felt dryers. An experiment was run in the early summer to see if it were possible to run No. 5 paper machine without the bottom dry end felt. The felt which was

due for removal was cut off one and one-half hours before Sunday morning shut-down. The sheet passed through the dryers without any difficulty and saleable paper was made until shut-down. The operators found it necessary to increase the drying pressure from 12 to 20 p.s.i.g. It is possible that in a future experiment, run for a sufficient length of time to obtain stabilized conditions and with sufficient air pressure in the felt supply nozzles to hold the paper tightly against the face of the dryers, we may find that efficient operation without a felt is possible. This would eliminate expenditures for felts, felt rolls, and dryers and increase efficiency by reducing down-time for spearing paper.

On May 14th during a shut down on No. 5 paper machine to patch the wire, the water was turned off the sweat dryer to prevent condensation from dripping on the felts. On start-up, the backtender failed to turn on the water to the sweat dryer, and was making a very dry sheet. He then reduced the steam pressure to increase the sheet moisture. There was no difficulty in building the reel and winding the paper. Steam pressure was reduced from 16 to 12.5 p.s.i.g. and steam consumption was reduced. This accidental experiment ran from 9:35 a.m. to 4:15 p.m. without difficulty. More work should be done to see if it is possible to operate continuously without the waste in steam which results from overdrying and replacing moisture with the sweat dryer.

References

(1) J. C. JORDAN, "Paper Mill Ventilation with Closed Hoods at Iroquois Falls", *Pulp and Paper Magazine Can.*, 54, No. 3 (Convention Issue, 1953).

(2) S. LUKIANOVITCH "Moisture Control with Closed Hoods", *Pulp and Paper Magazine Can.*, October, 1953.

(3) E. COWAN and B. COWAN, "A Theory of Paper Drying", *Paper Trade JOURNAL*, September 9, 1937. Vol. 105, No. 11.

Note:—Paper presented at the Annual Meeting of the Technical Section of the Canadian Pulp & Paper Association, Montreal, Que., January 27, 28, 29, 1954.

Finished Stocks to be Moved Out of Harrisville Mill

Management of the Harrisville Paper Corp. mill announced April 21 that it expected to put a skeleton crew of about five or six men to work soon to ship out for delivery paper stocks now in the mill warehouse, following a court order closing down the mill's paper making operations and establishing a "Debtors in Possession" status, as reported in last week's issue of Paper Trade *JOURNAL*.

Denying that the corporation had actually passed into receivership, George Helmstetter, office manager at Harrisville, said that the court order merely made a "debtors in possession" arrangement for the corporation during its reorganization and search for working capital.

He said that this status, while similar to receivership, was not identical, however. Receivership status includes appointment by the court of a trustee, while "debtors in possession" does not give managerial authority to an outside party, he pointed out.

Under this interim arrangement, he said, the mill is permitted to move out for delivery its stocks of finished paper, although no processing or manufacturing operations are permitted.

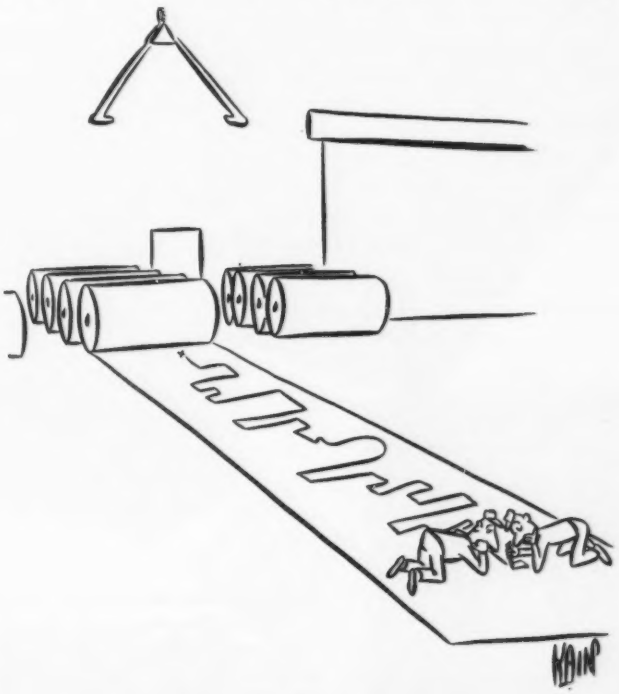
Jack A. Arnold, president, and Irvin Beckmann, secretary-treasurer, had both earlier been asked to resign. Mr. Arnold remains one of the stockholders in the Harrisville Paper Corp., which purchased the mill last fall from the St. Regis Paper Corp. G. E. Bass of Jackson, Miss., is the largest individual stockholder, and the St. Regis company still holds 25 per cent of the Harrisville Corporation's stock.

H&D Receives Eight Awards in Box Design

Of the 20 Hinde & Dauch entries in the annual design competition sponsored by the Fiber Box Assn., awards were presented for eight, in the following classifications: meat, poultry and eggs; high density products; small appliances; inner packing and inner containers; distinctive features; surface design and printing.

Second place awards were presented for the H & D "Never Leak" box, designed for the shipment of meats and other moist or granular products; and for the company's Hevi-Duty box for the shipment of nails, nuts, bolts and other heavy products.

Honorable mentions were awarded for the following enteries: The H & D "Double S" box for shipping live chicks; a new folder being used for the shipment of welding electrodes and other heavy products; an ingenious package for the shipment of a recessed ceiling lighting fixture; the inner packing designed to protect a builder's saw in transit; the distinctive method in which an electric fan was packed diagonally in a regular slotted box; and the outstanding job done with the four-color printing of a merchandising package.



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Long low voltage cable runs are wasteful. Savings realized by elimination of long low voltage feeders include cable cost, installation cost and cost of power lost. These savings alone will often justify modern Allis-Chalmers load center unit substations.

when relocation costs are high

Equipment relocation costs are sometimes excessive. Savings in relocation costs due to product changes or production modifications can be made by using Allis-Chalmers switchgear, bus duct and unit substations. Everything is salvageable!

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Experience with Synthetic Fibres in Felts

Report of a survey carried out by Paper Trade JOURNAL, investigating the results obtained by the mills with felts containing synthetic fibers.

Use of synthetic fibres in paper and board machine felts is a subject of much interest and activity on the part of the mills and felt manufacturers at the present time. Paper Trade Journal has just completed a survey of paper and board mills as to their experience with felts containing synthetic fibres.

It would appear that the subject is still largely in the experimental stage. Because of the highly competitive nature of their business and because they feel that their development work isn't complete, the felt companies are reluctant to discuss the subject for publication, other than in the most general terms. A survey of a large number of mills making a wide range of paper and boards revealed the following main points:

- All the mills expressed much interest in the subject.
- A few of the mills had not tried any synthetic containing felts yet.
- A large number of mills have tried synthetic containing felts but not in sufficient number to be able to draw definite conclusions as to their value.
- A smaller number of mills reported facts and figures on the results they have obtained with these felts.
- All of the definite reports from mills using synthetic felts were favorable on whole, although sometimes with qualifying comments.
- Of the two synthetic fibres mentioned as being tried it appears that Nylon is used more frequently than Dacron.
- Experience does not seem to be as favorable with 100 percent synthetic fiber felts, as with felts in which the large percentage of fibre is made up of wool. However, in a personal interview one mill manufacturing high grade boards reported that they ran a 100 percent synthetic bottom felt for *six months.*

We have selected typical replies from an assortment of mills producing various grades of papers and boards and reproduce them below. It appears to be too early to present a definite report on the subject. We plan to produce another report as soon as research and development work seem to have stabilized and the mills have had more experience with these felts.

New York Tissue Mill

We have had very good results with some Dacron wet felts on our cylinder machines.

We found in using 50% dacron and 59% wool on our wet felt position that our felt life jumped from four days to fifteen days. We cannot divulge the name of the felt company at this time or have the name connected with this run, as the run was made in strictest confidence. The writer was very happy with the results, as we thought and were warned by the felt company that due to the large amount of Dacron we might get excessive stretch in the length of the felt, but this did not prove true. In fact, it run on the jack in the exact position that the 100% wool felt run. The tons produced in per day's run and the very good formation of the sheet were very gratifying, as we did not get the usual amount of heavy slingoff on the couch.

Book Paper Mill

We operate two fourdrinier machines, each having a suction first and plain second reverse press. We have tried and are still trying felts using from 5% to 15% of Nylon fibre in the filling, and up to date have obtained the following results:

On our No. 1 machine 1st press, we have had an average life of approximately 24 days with 100% wool felts, and have only used one Nylon filled felt, but did obtain 46 days on that one.

No. 1 machine press had been averaging 22 days and is now running about a 45-day average with Nylon content.

No. 2 machine 1st press has averaged 25 days with the regular and 39 days with Nylon content.

No. 2 machine 2nd press has averaged 27 days with regular felts and is now averaging 47 days with Nylon content.

We feel that there is a very definite improvement in cost per ton of paper and can see not detrimental effect on the finish of the paper made. There has been no more down time for washups than normally would be expected on the 100% wool felts.

High Grade Cylinder Board Mill

Nylon is the only synthetic fiber we have used in our felts. Felts with 10% Nylon tend to hold their length better than 100% wool. We don't use top felt marks in paper much quicker than all wool.

Synthetic yarn appears much harder than wool.

New England Tissue Mill

We have a fourdrinier pick-up machine, manufacturing mostly 10 lb. tissue.

We have been using on our bottom or wet felts 10 to 14% Nylon content, which increases the drainage enough to make it worthwhile. Since we have been using the 10 to 14% Nylon content in our top felts we have experienced no trouble with blowing.

Southern Kraft Paper Mill

We wish to advise that we have used several 17% nylon felts in our first press position. We definitely obtained longer service from the 17% nylon felts. Our average felt in this position, using a conventional felt is running fifteen days, while with the 17% nylon felts used we have averaged twenty-two days. We have not used a sufficient number of Nylon content felts to feel that the above is conclusive, however, we certainly believe, at the moment, that the above indication is true.

Large Mill Making Wide Range of Printings, Writings, etc.

We have used wet felts with synthetic fibers in varying proportions. Our findings are that the low percentages of synthetic fibres are beneficial. Most of these have been Nylon content. We have used a few 100% synthetic felts with discouraging results.

New Waste Paper Bale and Carloading Specifications

Attached to the latest issue of the *News and Ideas Bulletin*, of the midwest consumers of Waste Paper is a folder describing a set of experimental bale and carloading specifications drawn up by a Study Committee of Consuming Mill and Dealer executives. These specifications are the result of nearly eighteen months of study by the Committee to develop practical baling and loading standards for Waste Paper shipments.

Basic to the attainment of these bale specifications is increased bale density. This can be achieved by more careful loading of Waste Paper into the baler —by more uniformly packing the baler from end to end.

After considerable experimentation with various bale sizes, the Study Committee settled on the following dimensions for all grades of Waste Paper:

Bale Length: 72″
Bale Depth: 32″
Bale Width: 45″

Length and depths are, of course, fixed by the actual dimensions of the baler chamber. However, upon removal from the baler, there is usually a slight expansion depth-wise. The 32″ depth allows for this expansion.

The bale width, on the other hand, depends upon how much paper is placed in the baler and on the pressure exerted on the paper. A 45″ depth (after release of pressure and subsequent expansion) proved to be the most practical.

After deciding upon standard bale dimensions, the Committee tackled the problem of density. Because individual grades have different densities, it was necessary to decide upon practical densities for these grades.

Experimentation showed that the following were practical:

Mixed: 22# per cubic foot
News: 25# per cubic foot
Corrugated: 15# per cubic foot

With fixed dimensions and densities, the following bale weights resulted:

Mixed: 1,320#
News: 1,500#
Corrugated: 900#

Next, loading patterns were developed which were practical for the loading of 40,000 pounds of any grade of Waste Paper in a 40 foot car and for loading to full legal capacity in trucks and trailers.

Improved Lithographers Technique of Checking Color Separations

An improved technique designed to aid lithographers in using diazo-sensitized film (Technichrome) to check process color separations has been developed by the Tecnifax Corp., Holyoke, Mass. It is explained that the use of diaxo-sensitized color films for proving has been a recognized device for several years. However, because of the difficulty in matching diazo colors, both in hue and intensity, to the variety of inks used by lithographers, considerable interpretation was necessary in order to derive any real information from diazo films. The new technique makes possible much closer and more direct reading results, it is said.

A Color Separation Guide has been developed which enables lithographers to prepare diazo film strips with a range of several intensities of each process color. These strips then can be compared with swatches of the process inks, in order to select the diazo film intensities which most nearly match the inks to be used.

After the desired intensity has been selected, color proving is accomplished as follows: first, a Tecnichrome film is placed in the vacuum frame and "flashed" by the arc lamp for the period of time required to produce the desired intensity. The color separation positive is then placed over the film and exposed to the arc lamp. After exposure, the film is developed in an ammonia vapor. The result is a positive reproduction of the separation in the desired color intensity. This procedure is repeated for each color.

According to the company, when the yellow, magenta, cyan, and black film prints are super-imposed and registered over a white background, the result approximates a completed lithographed job. The film colors are very close to the process inks. Although they require some interpretation, the difference is minor and constant, it is said. A little practice with the process enables the lithographer to check his positives and make corrections before plate-making, thereby cutting down proving time, and reducing the frequency of remaking plates.

The equipment necessary is a vacuum frame, an arc light, and an ammonia developer. Development can be accomplished in the developing section of a commercial, ammonia-developing, diazotype ("whiteprint") machine; or a simple developer may be improvised by utilizing an airtight container in which a small amount of ammonia has been allowed to evaporate.

The Color Separation Guide is available to lithographers on request to the manufacturer.

Honor Union Representative

Leonard J. Gagnon was tendered a testimonial dinner recently by management and employes of four eastern Connecticut paper manufacturing firms at the Ben Grosvenor Inn in Pomfret, Conn.

Mr. Gagnon, district representative of the International Brotherhood of Paper Makers, was transferred to a new assignment in St. Petersburg, Fla., April 17. He has been affiliated with union activities for about 40 years and has been servicing the Massachusetts and Connecticut area for the past decade.

Milton E. Yeoman, personnel director of Rogers Corp., paid high tribute to Mr. Gagnon "as doing an outstanding job in fostering faith in labor management relations." The guest of honor received a number of gifts.

Among those attending the dinner were Treasurer R. F. Hawley and vice-president of manufacturing; S. A. Brown of Rogers Corp. which has plants in Goodyear and Manchester; President William Foulds of the Lydal-Foulds and Colonial Board Companies of Manchester; and Production Manager H. R. Jensen of Inland Paper Board, Versailles.

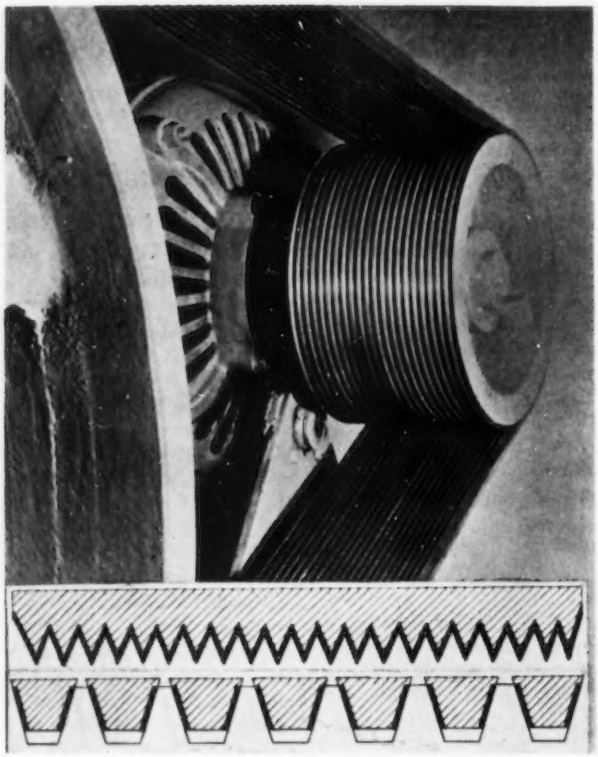
Union officials included Matthew Straub, president of Rogers Oak Lodge 43 in Goodyear; Frank Andrews, president of Rogers Maple Lodge, 544 in Manchester; Walter Smith, president of Loyal Foulds Park Lodge 343; Adolph Czkowsky, president of Inland Local 283; John Dinan, president of Local 168 at the Robert Gair Co., Montville.

Cole Resigns As Deputy Public Printer

Philip L. Cole has resigned as Deputy Public Printer effective April 30, the Government Printing Office announced on April 12.

In accepting the resignation, Public Printer Raymond Blattenberger praised Mr. Cole's accomplishments in rising from the post of apprentice printer to Deputy Public Printer. In particular, Mr. Blattenberger thanked Mr. Cole for his assistance during the past year—the first year Mr. Blattenberger has served as Public Printer.

NEW EQUIPMENT AND SUPPLIES



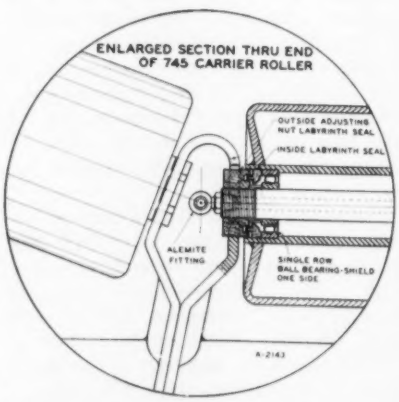
Solid V-Ribbed Belting Employs New Concept

Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J., has introduced a new concept of power transmission known as the Poly-V Drive. The drive employs the Poly-V Belt, which is a single, endless rubber belt with a series of parallel V ribs molded lengthwise around the inside circumference. Poly-V sheaves have been designed to accommodate this belt.

It is said that since the belt covers the full width of the sheaves, its load is distributed equally over the driving surface, instead of being divided among several V-belts. It is claimed that the new belt gives twice the traction contact area of a comparable multiple V-belt application. (See comparable dark lines in the inset drawing above). This feature is said to produce 50 per cent greater horsepower with the same width or equal horsepower with one-third less sheave width.

Other claims are: reduction of face pressure to give longer life to belt and sheaves, elimination of need to match sets of V-belts, elimination of belt turnover and progressive belt sinking in sheave grooves, and economy in belt and sheave inventories.

The new belt is available in two cross-sections: #187 and #375. These two sizes are said to meet all drive requirements from 3-inch pitch diameter sheaves and 50-inch belt pitch lengths, upwards. #187 is designed for drives where A, B, or C section V-belts would be used; #375 is for drives where C, D, or E section V-belts would be specified.


ENLARGED SECTION THRU END OF 745 CARRIER ROLLER
OUTSIDE ADJUSTING NUT LABYRINTH SEAL
INSIDE LABYRINTH SEAL
ALEMITE FITTING
SINGLE ROW BALL BEARING-SHIELD ONE SIDE
A-2143

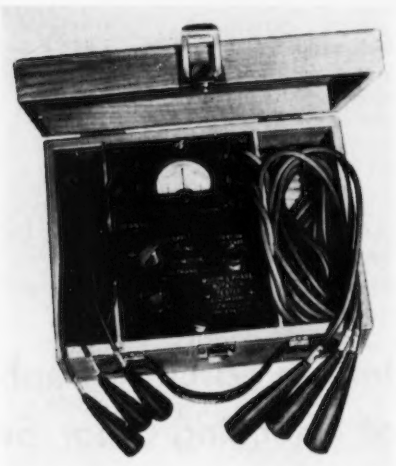
Conveyor Belt Carrier

The SP-745 belt conveyor carrier is said to incorporate a number of design features typical of more expensive units. It is made by Standard Products Div., Stephens-Adamson Mfg. Co., Aurora, Ill.

According to the manufacturer, the unit's four-inch diameter rollers have spun ends and turn on precision ball bearings. Die cast labyrinth seals are said to be non-corrosive and to provide permanent bearing protection. The bearings are pre-lubricated "for life", but Alemite fittings are provided for relubrication if desired. Detail of bearing construction is shown above.

Carrier frames are of jig-welded steel construction. Formed steel brackets and inverted angle base are designed to prevent build up of dust and dirt. Carrier rolls are interchangeable and can be inserted or removed from brackets without tools. An extended lubrication kit is available for lubrication from one side of carrier.

The carrier is available for stock shipment in sizes for 18, 24, 30 and 36 inch belts.

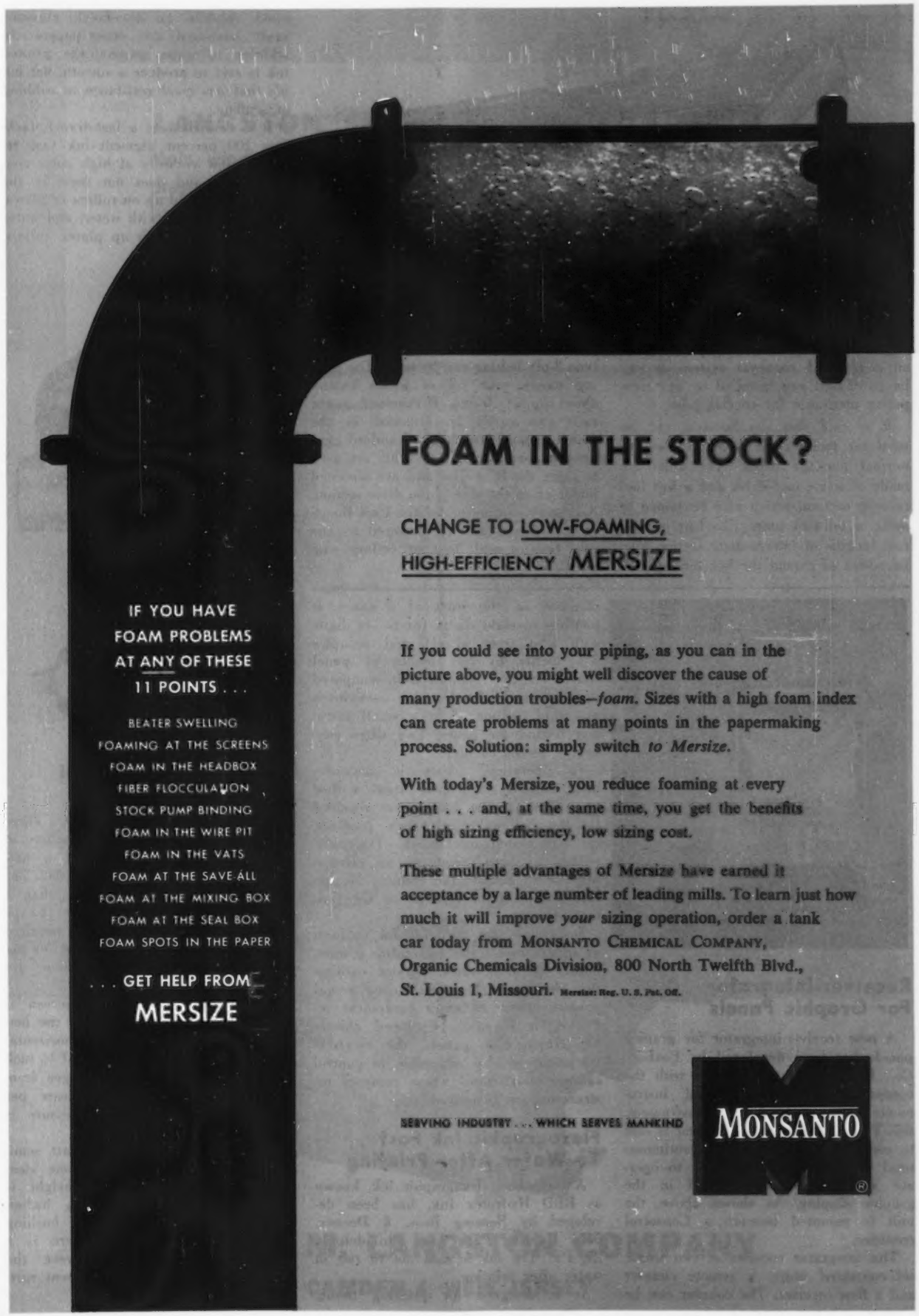


Unit for Testing Motor Rotation & Phase

Said to be the first device for determining the direction of rotation of electric motors and also the phase rotation or sequence of energized power circuits, the Biddle Motor Rotation & Phase tester is available from James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

The tester can also determine, it is said, the polarity of power and instrument transformers and can be used as a continuity tester in checking electrical circuits. Use of the tester will eliminate temporary "trial-and-error" connections, which are time consuming and even hazardous where high-voltage motors are involved.

Furnished in an oak case, the testing set weighs 10 pounds and is supplied with three line and three motor leads which store in the compartments on either side of the instrument panel. Full details are contained in bulletin 80-80, available from the manufacturer.



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IF YOU HAVE FOAM PROBLEMS AT ANY OF THESE 11 POINTS . . .

BEATER SWELLING
FOAMING AT THE SCREENS
FOAM IN THE HEADBOX
FIBER FLOCCULATION
STOCK PUMP BINDING
FOAM IN THE WIRE PIT
FOAM IN THE VATS
FOAM AT THE SAVE-ALL
FOAM AT THE MIXING BOX
FOAM AT THE SEAL BOX
FOAM SPOTS IN THE PAPER

. . . GET HELP FROM MERSIZE

If you could see into your piping, as you can in the picture above, you might well discover the cause of many production troubles—*foam*. Sizes with a high foam index can create problems at many points in the papermaking process. Solution: simply switch *to Mersize*.

With today's Mersize, you reduce foaming at every point . . . and, at the same time, you get the benefits of high sizing efficiency, low sizing cost.

These multiple advantages of Mersize have earned it acceptance by a large number of leading mills. To learn just how much it will improve *your* sizing operation, order a tank car today from MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Missouri. Mersize: Reg. U. S. Pat. Off.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

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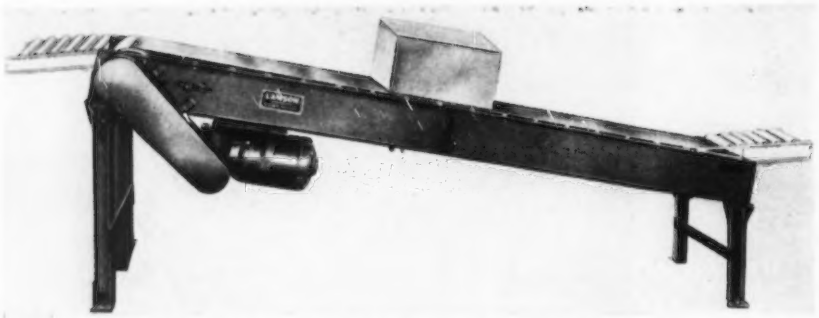
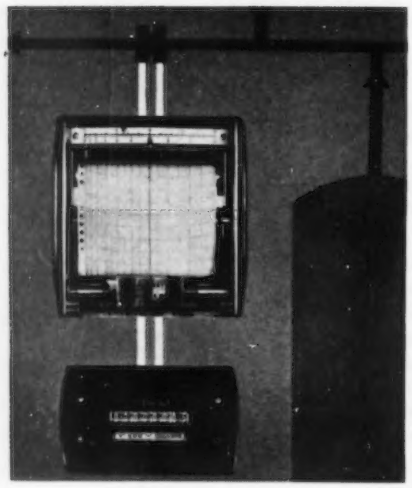


Packaged Booster Unit for Conveyor Lines

Lamson Corp., Syracuse 1, N. Y., is now marketing the Lamson Unit Booster. Described as a complete package in itself, the booster can be incorporated into an engineered conveyor system or can be purchased and installed by any competent mechanic for special jobs.

It is said that the boosters can be used for inclines up to 30 degrees for normal package loads. The units are made of a five-foot drive and a five foot take-up section, which may be joined to make a ten-foot unit. Five-foot or ten-foot lengths of intermediate section may be added to extend the booster, in multiple lengths of five feet, up to 60 feet total length.

The units are available in two widths, 18 inches and 30 inches. Any standard type 3-ply belting can be used. The belting moves over rollers which extend above the side frame. If required, guard rails can easily be attached to the frame to guide the load. Standard gear head motors from 1/3 to 1 hp. are used to drive the 8" pulley and are mounted under or on the side of the drive section. Accessory equipment for the Unit Booster includes a tail belt powered by the unit booster and floor or ceiling supports.



Receiver-Integrator For Graphic Panels

A new receiver-integrator for graphic panels has been developed by Foxboro Co., Foxboro, Mass., for use with the company's line of Consotrol instruments. A pneumatic-electric instrument, this Type 224 Receiver-Integrator is said to compute an accurate and continuous total of any process flow and to operate a small counter located in the graphic display. As shown above, the unit is mounted beneath a Consotrol recorder.

The integrator consists of two small, self-contained units: a remote counter and a flow receiver. The counter can be mounted on the front of a panel. It totalizes to eight digits (or to six digits with zero reset wheel) and occupies 3¼ inches by 5½ inches of panel space. The flow receiver unit, composed of a receiver bellows and a cam-switch assembly, is housed in a small metal box behind the panel. Two wires connect it to the counter.

In operation, pneumatic measurement signals (3-15 psi) from a flow transmitter at the process are received by the bellows which then positions the cam-switch mechanism. The cam-switch, in turn, produces an electric impulse to actuate the counter in precise and constant relation to the flow measurement.

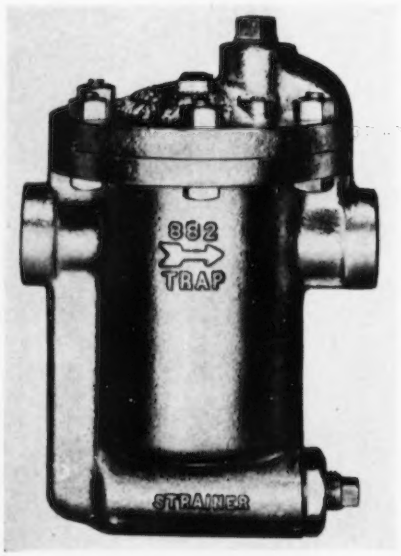
Integrators are available for uniform or square root scales to totalize minute, hourly or daily rates. Service calibration checks can be made during actual operation with no extra equipment required, it is said. Developed chiefly for graphic-type panels, the receiver-integrator is also adaptable to control cabinet installations where compact instrumentation is desired.

Flexographic Ink Fast To Water After Printing

A water-base flexographic ink, known as BBD Hydrotex Ink, has been developed by Bensing Bros. & Deeney, 3301 Hunting Park Ave., Philadelphia 29, Pa. The ink is said not to run in water after printing.

It is designed for printing tissue, bond, sulphite, machine-finish, glassine, kraft, boxboard, and other papers. In addition to water-fastness, the printed ink is said to produce a smooth, flat finish that has good resistance to rubbing or scuffing.

It is described as a fast-drying, tack-free 100 percent pigment ink that retains a low viscosity at high color concentrations and does not form in the fountain or build up on rollers or plates. It can be thinned with water, and water can be used to wash up plates, rollers, and fountains.



Larger Model Integral Strainer Steam Trap

Armstrong Machine Works, Three Rivers, Mich., has added to its line of integral strainer steam traps, a new larger model designated as No. 882. The new trap is said to cost less than a standard trap plus separate Y-type strainer, and fewer fittings are required to install it. It is recommended for use where dirt and scale conditions are bad.

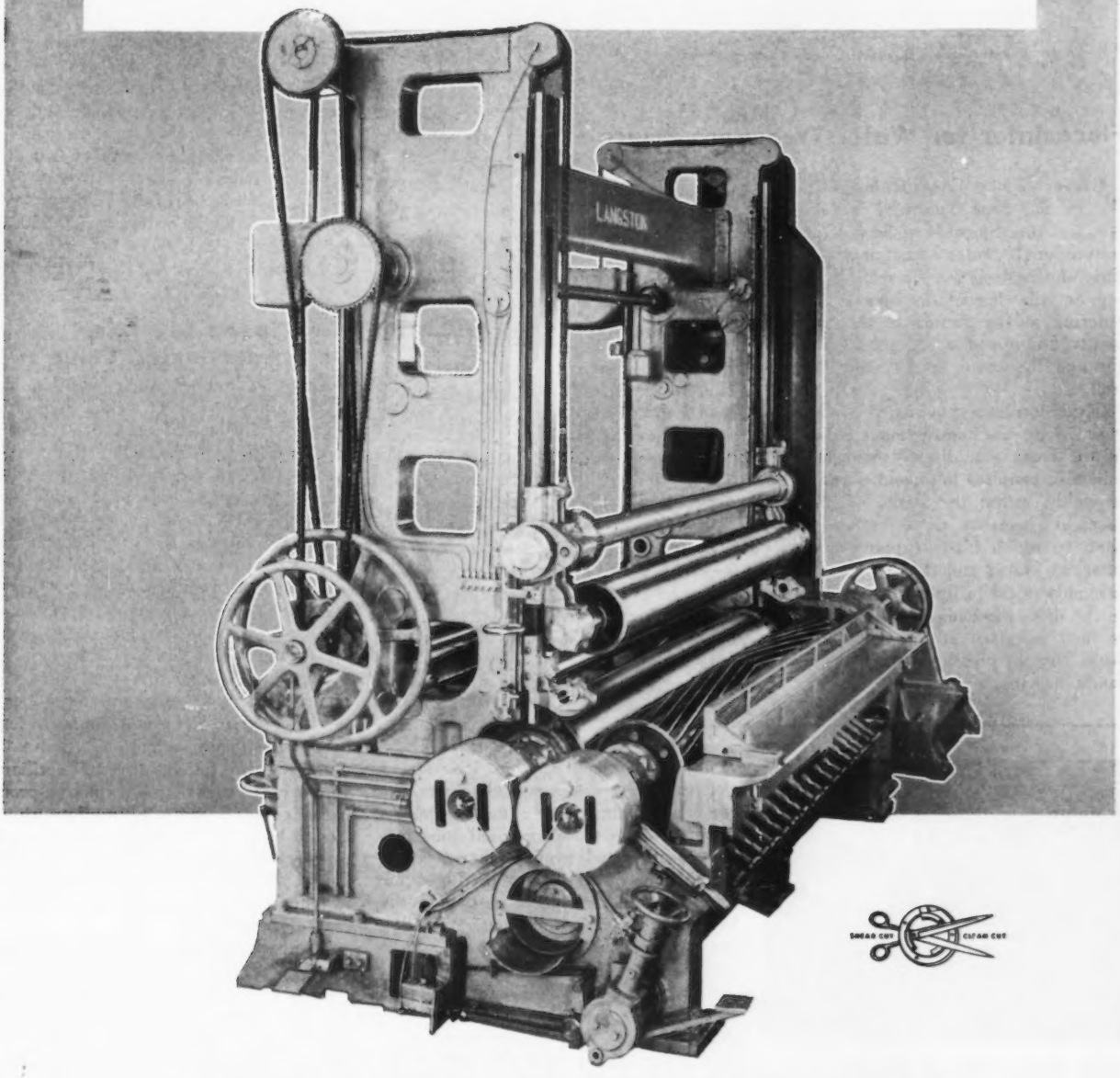
A stainless steel strainer screen is located in the body casting at the bottom of the trap. The unit has horizontal and opposite pipe connections of ½ inch or ¾ inch size. Capacity ranges from 1300 to 2200 pounds condensate per hour. Maximum operating pressure is 250 psig.

The body is fine grained cast semi-steel. Internal parts are chrome steel and stainless. Overall trap height is 8-11/16 inches, diameter 5⅝ inches. Weight is 15 lbs. The strainer bushing has straight threads and there is a copper asbestos gasket between the bushing and body said to prevent rusting-in or "freezing."

LANGSTON SLITTERS AND WINDERS

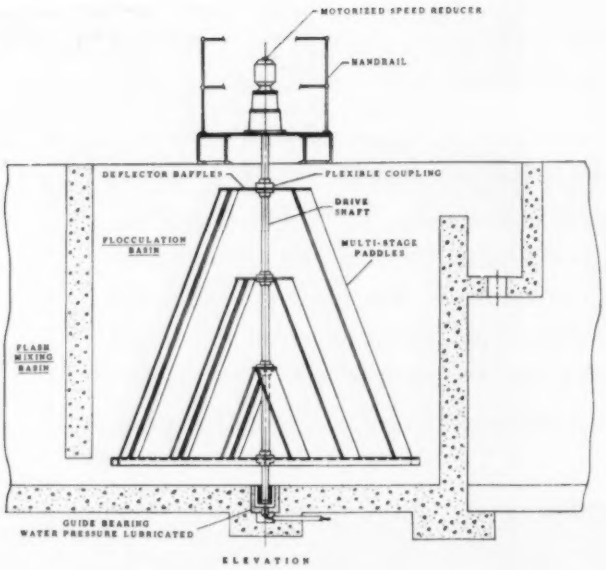
Main winding drums, power driven slitter shaft, idlers and top pressure or riding roll are statically and dynamically balanced for high speed performance. In addition, the winding drums are equipped with hydraulic brakes so that the machine can be brought to a smooth and rapid halt at the end of each roll.

For highest quality rolls with minimum upkeep—specify Langston.



SAMUEL M. LANGSTON COMPANY

CAMDEN 4, NEW JERSEY



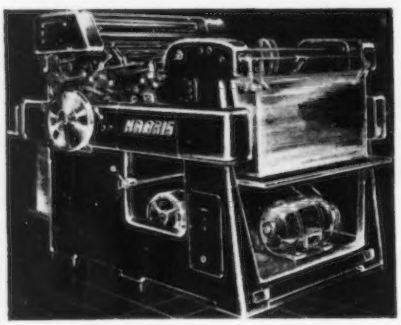
Flocculator for Water Treatment Plants

Graver Water Conditioning Co., 214 W. 14 St., New York, N. Y., is now offering the Spirol-Mix flocculator for conventional water treatment plants. This unit is designed for vertical mounting in the flocculation basin. Water entering at the bottom of the basin is gently roll-mixed as it passes upward through the basin to the outlet at the top.

The flocculator consists of a variable-speed drive mechanism mounted on top of the basin and directly connected by a flexible coupling to a paddle-type mixer assembly within the basin. The mixer assembly consists of a vertical drive shaft to which blade support arms are attached. Load and thrust of the entire assembly is taken up by thrust bearings in the drive mechanism. The drive shaft is held in place at the bottom of the basin by a pressure, water-lubricated guide bearing.

The pitch of each set of diagonal blades is slightly increased toward the central axis to create a propeller-like action which is said to assure a gentle, uniform multi-swirling motion over the entire area of the basin. The step arrangement of each set of diagonal blades results in a decrease in total blade area from the bottom to the top of the basin. Therefore, as the water rises in the basin, it is subjected to a decreased rate of agitation, preventing the destruction of floc formed in the early part of the operation.

Blade support arms are designed to support the upper extremities of the diagonal blades. Also, they serve as deflector baffles to disperse the flow of water away from the drive shaft into the rolling flow of rising water. The lower ends of the diagonal blades are attached to a channel support arm.



Job Size Offset Press

A new 14-inch x 20-inch Harris offset press Model 120 for professional job printing is now in manufacturing production at Harris-Seybold Co., 4510 E. 71st St., Cleveland 8, Ohio. It is stated that the press was designed to give the commercial lithographer and printer an opportunity to move marginal jobs into the "professional profit" category. Use for the new press is also predicted for letterpress plants which postponed the swing to combination-shop operation until professional press equipment in a traditional job-press-size was available.

The press is adaptable to many different jobs and is equipped with built-in controls and automatic features. It can accommodate standard form work, color letterheads, 9x12 inches bleed pages, etc. Sheet size ranges from a minimum of 8x10 inches to a maximum of 14½ x 20½ inches, with a maximum image (transfer of 14⅛ x 20 inches).

Sealed Limit Switch

A completely-sealed heavy-duty 51MII limit switch, designed for use on all types of industrial equipment where dust, dirt, abrasives or liquids may be present, has been developed by Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill. The switch's entire housing, including the operating head with its actuator and return machanism, is sealed. All moving parts and contacts are protected from wear, clogging, and corrosion, it is said. The die cast enclosure is also designed for protection of the replaceable switching unit.

The switch may be mounted in almost any position in relation to the means of actuation. The operating head is adjustable to any of four horizontal positions and the roller may be reversed on the arm. The roller arm may be adjusted to operate clockwise, counter clockwise, or in both directions and the actuator arm assembly is adjustable through 360 degrees to any of 870 different positions.

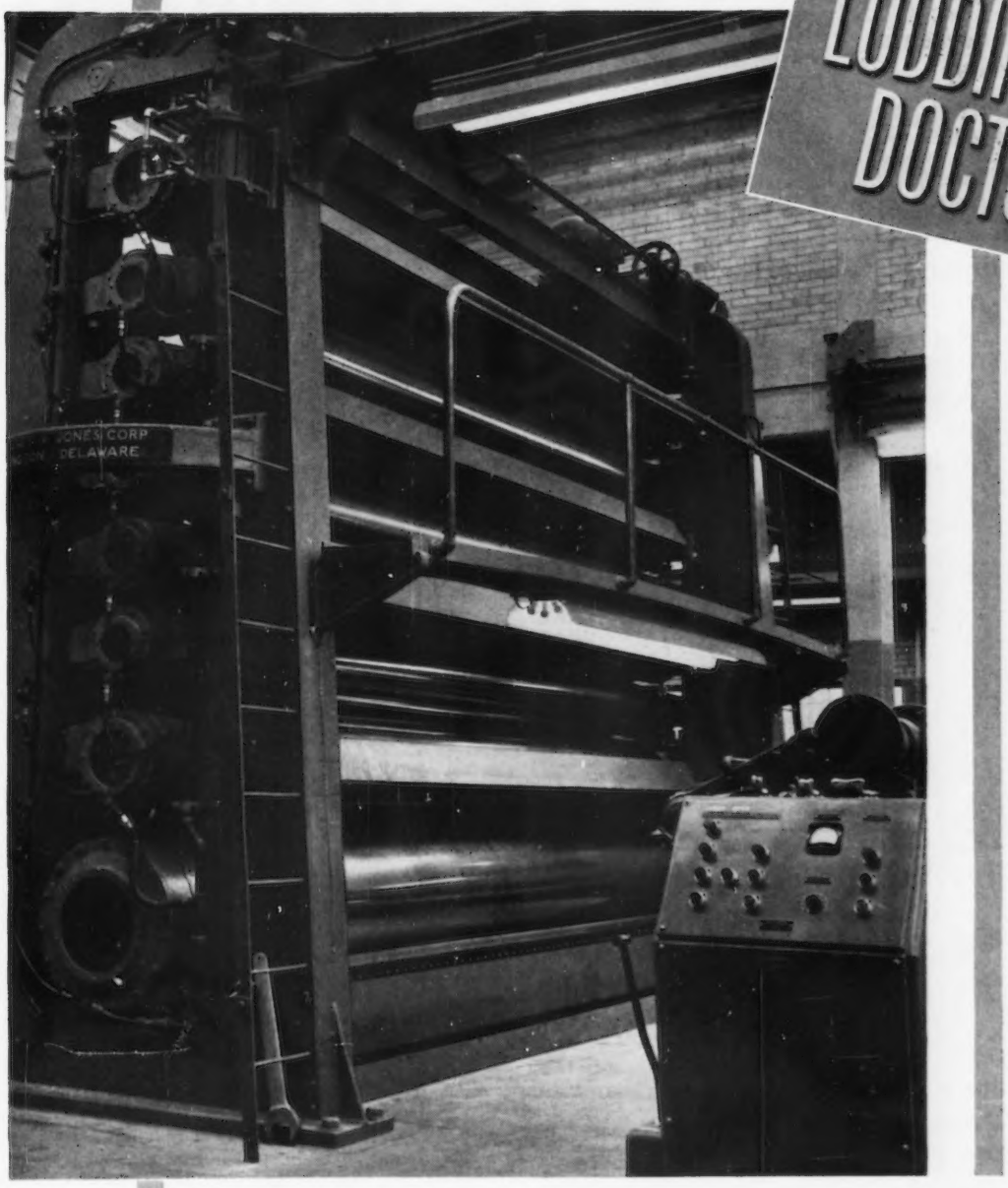
The switch is listed by Underwriters' Laboratories for 20 amperes 110, 220 or 440 volts a-c, ½ ampere 115 volts d-c; ¼ ampere 230 d-c; ¾ H.P. 110 volts a-c; 1½ H.P. 220 volts a-c.

High-Speed Diversion Or Proportioning Valve

Kieley & Mueller, Inc., 171 Gemung St., Middletown, N. Y. is manufacturing a 3-way valve that is cylinder-operated and said to combine high travel with extreme speed on both the pressure strokes and spring return.

When used as an emergency diversion valve with less than 100 psi on the cylinder, full travel with tight shut-off is accomplished in half a second, it is said. On spring return, the same high speed operation can be achieved. Use of the spring return, rather than double-acting cylinders, permits the valve to fail in either the open or closed position as required for maximum safety under emergency conditions. Valve is designed also for the use of auxiliary equipment such as explosion-proof signal contacts or solenoid pilots which feed or bleed for on-off operation through pipe rather than small instrument tubing. Cylinders may be actuated by air, suitable gases, or any normal fluid actuating medium.

Although the valve is provided with quick-operating ports for emergency service, it is also available with V-ports and valve positioners for throttling applications. Valves may be supplied in any machineable metal in standard sizes from ½-inch to 10-inch with either Teflon or greased lubricant stuffing boxes. Position indicators with an accessible open yoke of all steel shock-proof construction are standard.



LODDING DOCTORS

Still another installation of Lodding modern calender doctors . . . *hydraulically oscillated*

LODDING ENGINEERING CORPORATION
WORCESTER, MASSACHUSETTS
REPRESENTED BY
W. E. GREENE CORPORATION • WOOLWORTH BLDG., NEW YORK

NEWS OF ASSOCIATIONS

Complete Arrangements For Pacific Meeting

Final arrangements have been made for the technical program to be presented at the joint spring meeting of the Pacific Section of TAPPI and the Pacific Coast Division of The American Pulp and Paper Mill Superintendents Assn. This meeting will be held at the Gearhart Hotel, Gearhart, Ore., May 20-22.

On Friday morning, May 21, F. J. Weleber of Publishers' Paper Co. will preside over a joint session. This will include a discussion of "A New Unit of Chip Measurement and Methods of Chip Compaction" by Edmund Ericksen of Longview Fibre Co. William E. Beeman, Crown Zellerbach Corp. will discuss "Comparison of Log Barkers" and Thomas R. Miles, consulting products engineer, "Chips—Saws to Cars."

"New Alloys for Pulp and Paper Industry" will be discussed by Frank A. Guba, manager of research and development of Carpenter Steel Co., Union, N. J. Max A. Bailey of Westminster Paper Co. will preside over this joint session.

The papermaking discussion following will be broken down into three groups. Cecil Taylor, Columbia River Paper Mills, will preside over "Machine Clothing and Accessories"; Thomas Grant, Publishers' Paper Co., over "Increasing Sulphite Yields"; and L. D. McGlothlin, Crown Zellerbach Corp., over "Kraft Mill Losses."

On Saturday morning E. H. Nunn of Crown Zellerbach Corp. will preside over the joint session covering the following topics:

"Hot Pressing on Paper Machines" by W. W. Clarke of Longview Fibre Co.

"Effective Use of Man Power" by Gus Ostenson, Crown Zellerbach Corp.

"Reduction of Wood Waste" by C. C. Heritage, Weyerhaeuser Timber Co.

This broad program will be complemented by a variety of social activities, including a buffet supper on Thursday night. The joint luncheon on Friday will be addressed by Frank Warren, executive vice-president of Portland General Electric, who will talk on the subject, "Power in the Pacific Northwest." Friday night entertainment includes a cabaret dinner and informal dancing.

Superintendents Local Meeting Dates

DATE	DIVISION	PLACE
May 6-7	Northwestern Div.	Leamington Hotel, Minneapolis, Minn.
May 14	Connecticut Valley	Roger Smith Hotel Holyoke, Mass.
May 14-15	Penjerdel, Spring Meeting	Yorktowne Hotel, York, Pa.
May 20	Michigan	Harris Hotel Kalamazoo, Mich.
May 20-21	Pacific Coast Joint TAPPI	Gearhart Hotel Gearhart, Ore.
June 4	Miami Valley Div.	Orr Felt & Blanket Co. Piqua, Ohio
Sept. 2-4	New York-Canadian	Saranac Inn Saranac Inn, N. Y.
Sept. 23-25	Northeastern Div.	Poland Spring House Poland Spring, Maine

TAPPI Local Meeting Dates

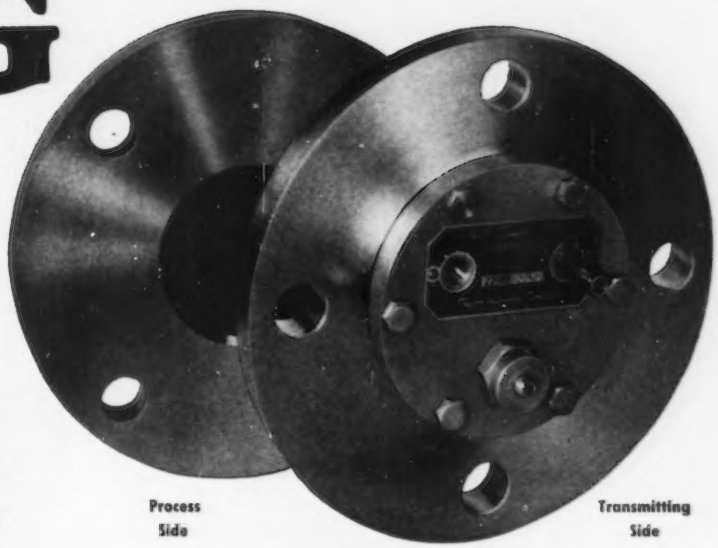
DATE	DIVISION	PLACE
May 6	Kalamazoo Valley Section	Hotel Harris, Kalamazoo, Mich.
May 7	Central District Empire State	University Club, 431 E. Fayette St., Syracuse, N. Y.
May 11	Ohio Annual Meeting	Hartwell Country Club Cincinnati, Ohio
May 11	Lake States Annual Social Meeting	Butte des Morts Club Appleton, Wis.
May 11	Metropolitan District Empire State	Fraunces Tavern Pearl & Broad Sts., N.Y.C.
May 14-15	Southeastern	Hotel De Soto, Savannah, Ga.
May 17	Chicago	Chicago Bar Assn. Chicago, Ill.
May 19	Eastern District Empire State	Milfranks Restaurant Glens Falls, N. Y.
May 27	Delaware Valley	Engineers Club 1317 Spruce Street, Philadelphia, Pa.
June 10-12	Empire State Annual Meeting	White Face Inn Saranac Lake, N. Y.

National Meetings are shown under "Remember These Dates" on page 5.

April Meeting of Ohio TAPPI Studies Starch

Starch was the topic of the April meeting of the Ohio Section of TAPPI which was held in Indianapolis, Ind., on April 8, 1954. The meeting consisted of a tour of the Indianapolis plant of National Starch Products, Inc., in the early afternoon, a symposium and panel discussion on starch in the late afternoon at the Lincoln Hotel, Indianapolis, and an evening supper meeting at the Lincoln Hotel. The panel members at the afternoon meeting were Dr. J. Thomas Schock of Corn Products Sales Co. who spoke on starch chemistry, James P. Casey of A. E. Staley Mfg Co. who spoke on beater and wet end applications of starch, and Dr. J. E. Killinger of Penick and Ford, Inc., who spoke on surface applications of starch. The address at the evening supper meeting was given by Dr. A. T. White of National Starch Products, Inc., whose paper was entitled "Tailor Made Starches for the Paper Industry."

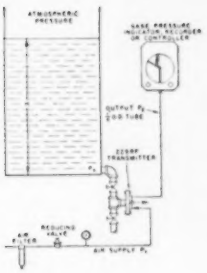
DOESN'T CORRODE or CLOG



Process Side

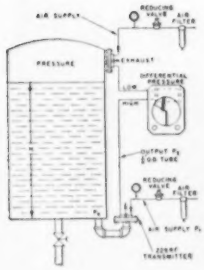
Transmitting Side

APPLICATIONS



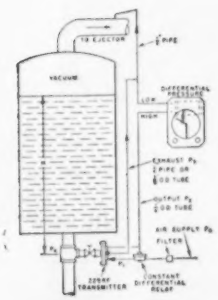
1

For Open Tanks. A typical Taylor 229R Transmitter installation on an open tank as used in **BLEACH TOWER, BLACK LIQUOR, SMELT DISSOLVING, PULP STORAGE, HEAD-BOXES, SIZE TUBS,** and stock lines, or for pressure measurement in pipe lines.



2

For Closed Tanks Under Pressure. Here transmitters are installed at both bottom and top of the tank and the differential pressure is measured by a mercury or aneroid manometer. Typical uses **— ACCUMULATORS, ABSORPTION TOWERS.**



3

For Closed Tanks Under Vacuum. For example, **DEAERATORS, VACUUM RECEIVERS.**

TAYLOR LIQUID LEVEL TRANSMITTER

Want to measure accurately the level of liquids that are corrosive or viscous—or contain solids? The Taylor 229R Liquid Level Transmitter is a force-balance unit specifically designed to measure pressure and liquid level of viscous or corrosive liquids and liquids containing solids. No levers or cams, so no frictional error. It's adaptable to open as well as closed tanks, under pressure or vacuum, and can be attached to the bottom or side of the tank to give accurate level measurement. Output can be connected with an indicator, recorder or controller as much as 1,000 ft. away from transmitter.

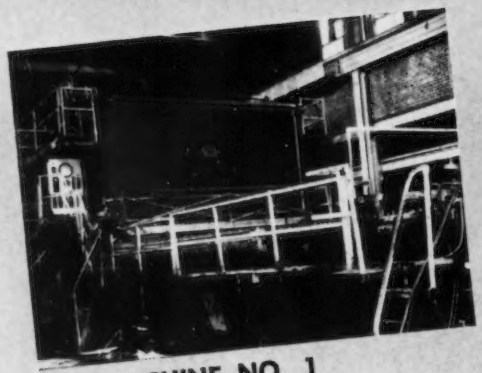
This is another example of how Taylor instrumentation can help you cut costs and protect product quality in almost every phase of paper manufacture. Ask your Taylor Field Engineer or write for **Bulletin 98069.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

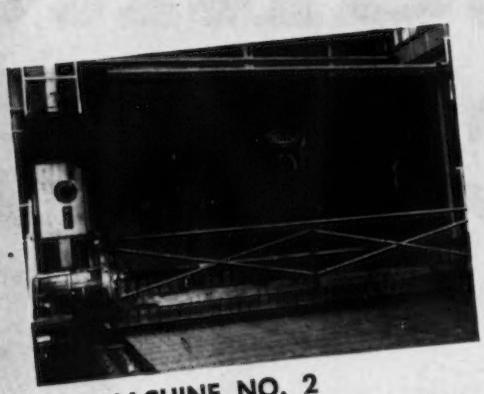
a success story

at UNION BAG and PAPER CORPORATION

Savannah, Ga.



ON MACHINE NO. 1
Open, gravity type Valley Inlet-Headbox
installed May 1949

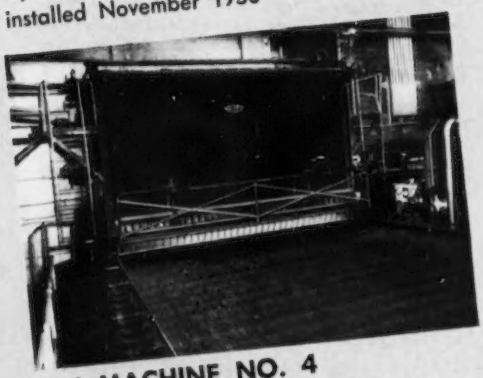


ON MACHINE NO. 2
Open, gravity type Valley Inlet-Headbox
installed January 1951

ON MACHINE NO. 3
Open, gravity type Valley Inlet-Headbox
installed May 1950

ON MACHINE NO. 5
Open, gravity type Valley Inlet-Headbox
installed November 1950

ON MACHINE NO. 4
Pressure Secondary Valley Inlet
installed October 1951



ON MACHINE NO. 4
Gravity-type Primary Valley Inlet
installed October 1951

ON MACHINE NO. 6
This new No. 6 machine is equipped with Valley Pressure Primary Inlet. Started up May 1953. Opinion of mill managers is "No. 6 performance is outstanding!"

7 VALLEY INLETS on 6 PAPER MACHINES

*Present capacity 1800 tons daily

It was in May 1948 that Valley was called to Savannah to discuss stock entrance equipment with the Union Bag and Paper Corporation — world's largest paper mill.*

In May the following year, an open, gravity type Valley Inlet-Headbox combination was installed on No. 1 machine. Since that time *all six* of Union's giant 236" machines have been equipped with Valley Inlets — including a seventh secondary installation on machine No. 4.

We believe that this record of seven Valley Inlets installed in *one mill* within a period of four years *speaks for itself.* It suggests that *you too* may profit from a conference with our engineers regarding the possibility of improving the performance of *your own* stock entrance equipment. Your inquiry requesting information or an interview will be given prompt attention.

VALLEY IRON WORKS COMPANY
Appleton, Wisconsin

VALLEY INLETS

Outline of Supts. Convention Program

Members and friends of The American Pulp and Paper Mill Superintendents Assn. who attend the 35th Annual Convention which is scheduled for June 21-23, 1954 at the Sheraton-Mount Royal Hotel, Montreal, Canada, according to Donald R. Dick, president of the association, will be in for a real Canadian welcome.

There will be a number of excellent papers and panel sessions and some good entertainment. Likewise for those persons who have the time and are in a vacationing mood, Montreal offers so much of interest.

A session designated as Operation Management is scheduled for the afternoon of June 21. Interesting papers by outstanding leaders in their respective fields are committed for this sitting. These papers include: "Men, Machines and Management" by A. E. Harold Fair, Alliance Paper Mills, Ltd.; "Labor Looks Ahead to 1964" by John P. Burke of the International Brotherhood Pulp, Sulphite and Paper Mill Workers; and "Compulsory Retirement — Right or Wrong?" by James C. Cameron, Professor of Industrial Relations, Queens University.

The group meetings which have been arranged cover High-Yield Pulping, Paper Machines, Paper Progressing, Paperboard, Engineering and Maintenance, and Chemical Pulping. Most of the papers for each of these several sessions are already assigned.

There will be a paper on "Control of Moisture Content, Basis Weight and Caliper in the Paper Industry" by Willy H. Rau, Hygrotester, Inc.; a paper covering "Dryer Felts—A Literature Review" by Kenneth Hay, Asten-Hill Manufacturing Co.; a paper reporting on the accomplishments of the Dryer Felt Committee by W. K. Metcalfe, J. O. Ross Engineering Corp.; and a paper on "Selectifier Screens for the Paper Field" by James H. Martindale, Shartle Bros. Machine Co.

"Papers for Offset" will be the title of a paper by Al Beecroft, Rolph Clark Stone Ltd. Robert S. Young, Hammermill Paper Co., will present a paper on "Lowering Finishing Room Costs."

W. P. Nesbitt of Howard Smith Paper Mills, Ltd. is on the program for a paper on "Application of Eddy Current Couplings to Paper Machine Drives and Auxiliaries." There will be a paper on "The Use of Compressed Air in High-Speed Paper Machine Operation." This paper will be presented by G. M. Dick, Canadian-Ingersoll Rand Company, Ltd. There also will be a paper by Inglis W. Edwards, Chief Engineer, Dominion Engineering, on "Balancing and Use of Stroboscope in Paper Machine Maintenance."

There will be a joint paper by G. H. Tomlinson, II, and N. G. M. Tuck, Howard Smith Paper Mills Ltd. on "The Cleaning of Pulp Fibres." "Odor Counteraction in Kraft Mill Operations" is to be the unusual subject of John M. von Bergen, Airkem Inc. Dr. W. Howard Rapson, Professor of Chemical Engineering, University of Toronto will present a paper on "Chlorine Dioxide Bleaching"; while "Ultra High Density Bleaching of Chemical Pulp" will be the subject of a paper by Dr. W. J. Nolan, Professor Chemical Engineering Research, University of Florida.

Gerald Alcorn, Construction Engineer, Weyerhaeuser Timber Co., Pulp Division, Everett, Washington, is slated for a paper on "Engineering A Kraft Mill."

The last formal session, insofar as papers are concerned, will be held Wednesday morning, June 23. This session will be devoted to an appraisal of the newsprint field.

OBITUARIES

Russell Clarence Shearer, 50, of Raymondville, N. Y., general manager of the Raquette River Paper Co., died suddenly April 17 of a heart attack while inspecting timberlands in the Blue Pond section near the Granshue preserve of the company.

With him at the time was Paul Logan, of Potsdam, electrical superintendent for the paper mill. The two men had gone into the woods to fish and Mr. Shearer was also checking over the timber growth.

Mr. Logan said they had stopped momentarily on a ledge overlooking the pond and Mr. Shearer called his attention to an otter on the water. Mr. Logan spotted the otter and looked back at Mr. Shearer, who had fallen to the ground. Mr. Logan gave first aid but his companion died within a short time.

Mr. Shearer was a graduate of Syracuse university and had been in the paper making industry all his life. He served as superintendent of the St. Regis Paper Co. mill at Norfolk and was later with the Howard Smith Paper mills in Canada. About a year ago he was named general manager at Raquette River Paper Co.

Col. George R. Norton, 70, retired Eaton Paper Corp. executive, died April 8 in San Mateo, Calif. Col. Norton retired three years ago from his post as manager of traffic and control at Eaton's and moved with his wife to California.

After the World War I Armistice, Col. Norton resigned his commission to go to Pittsfield, Mass., as an industrial engineer with the old Eaton, Crane & Pike Co. He remained a colonel in the Reserve.

In 1927, he was appointed assistant to the company's late president, A. W. Eaton, and in 1930, he was appointed Pacific Coast manager. He held this post in San Francisco until 1942 when the West Coast branch was closed and he returned to Pittsfield.

Raymond Stick'en, 60, foreman for the Sorg Paper Co. where he has been employed for 33 years, died April 11.

Maynard J. Cusack, 47, 728 Grignon street, Green Bay, Wis., died April 17. His illness covered a three month period, and death was attributed to cancer.

At the time of his death, Mr. Cusack was vice-president of Shawano Paper Mills, which position he held since June 1952. Prior to that time he had been associated with Riegel Paper Corp. for 25 years. The position held was that of Western sales manager out of the Chicago office. For his work in research and development phases for the Food Program of the U.S. Army during World War II, he was given a special award from the Quartermaster Subsistence Research and Development Laboratory. He also served in the U.S. Army in World War II.

He was a member of TAPPI and the Paper and Twine Assn.

George O. Comfort, 85, one of the last survivors among Kalamazoo's early-day papermakers, died in Indianapolis on April 12.

Starting 65 years ago, Mr. Comfort participated in the organization and operation of four mills in the Kalamazoo Valley—the Bardeen Co. at Otsego and the Bryant Paper Co., the King Paper Co. and Monarch Paper Co. all of Kalamazoo. In addition he owned his own mills in New York and in Canada.

SMIDTH

ROTARY KILNS
FOR REBURNING LIME SLUDGE

The illustration above shows a modern, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charleston, South Carolina.

F. L. Smidth & Co. are specialists in the design and manufacture of rotary kilns and have furnished numerous installations in many countries for burning lime, lime sludge, dolomite, magnesite, cement, ores, etc.

For Smidth Machinery apply to:

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PRICES

MARKET WOOD PULP

Second Quarter Contract Prices Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances		
	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood		‡$60.00/$95.00*	§$77.50/$82.50§	§$80.00/ —	
Kraft, Bleached	140.00/147.50	145.00/150.00	§140.00/142.50§		§$142.50/ —
Semi-bleached, Kraft	130.00/135.00	130.00/135.00	§130.00/135.00§	130.00/135.00*	
Kraft, Unbl.	95.00/105.00	100.00/135.00	*105.00/110.00*	*105.00/135.00*	
Sulphite, Blchd.	140.00/ —	140.00/ —	§135.00/140.00*	140.00/ — *	§135.00/142.50*§
Sulphite, Unblchd.	120.00/ —	120.00/ —	§115.00/122.00*	120.00/125.00*	
Sulphite, Unbl. Gl'sn.		124.00/ —	*124.00/ —		
Soda, Blchd.	140.00/ —	140.00/ —			

‡ F.o.b. Shipping Point. § On Dock Atlantic Ports. * Freight allowed.

RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$12.50/$13.00
No. 1 Unblchd. Muslins	14.50/ 15.00
Blchd. & Unblchd. Underwears	15.50/ 16.00
Blchd. Canton Flannels	11.00/ 11.50
No. 1 Light Silesias	7.50/ 8.00
No. 1 Light Prints	6.00/ 6.50
No. 1 Blue Overalls	7.25/ 7.75
Suntan Khakis	6.00/ 6.50
Fancy Shirts	6.50/ 7.00
Mixed Khakis	3.50/ 4.00
Cottonades	3.75/ 4.25
No. 1 Washables	3.50/ 3.75

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$2.75/$3.00
Cotton Pants & Overalls	2.00/ 2.25
Thirds and Blues, Repacked	1.65/ 1.75
No. 2 Roofing Rags	nominal

COTTON LINTERS

Memphis Market

F.o.b. Oilmills

	Apr. 20 Per 100 lbs
Grade 1 n.a.	
2	n.a. / $9.00
3 1st cut—felting	8.00/ 6.50
4	6.00/ 4.50
5	4.25/ 3.25
6 * 2nd cut—chemical	3.00/ 3.00
7	3.00/ 3.00

* Based on 73% cellulose.

Bagging

(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$4.00/$4.50
Foreign Scrap Burlap	3.00/ 3.75
Heavy Wool Tares	4.00/ 4.25
Austr. Wool Pouches	4.00/ 4.50
Domestic Manila Rope	5.50/ 6.00
Domestic No. 1 Sisal Strings	5.00/ 5.25

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range or volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

	New York	Boston	Chicago	Phila.
	Apr. 26	Apr. 24	Apr. 26	Apr. 26
No. 1 Mixed Paper	$ — / 8.00	$10.00/ 11.00	$8.00/ —	$8.00/ —
No. 1 News	— / 12.00	13.00/ 15.00	15.00/ —	— / 12.00
Overissue News	15.00/ 17.00	16.00/ 20.00	20.00/ 22.00	18.00/ 19.00
Mill Wrappers	10.00/ 13.00	12.00/ 15.00	11.00/ —	12.00/ 18.00
Old Corrugated Containers	14.00/ 15.00	15.00/ 16.00	18.00/ —	14.00/ 15.00
No. 1 Sorted Br. Kraft Paper	40.00/ 50.00	35.00/ 50.00	25.00/ —	40.00/ 47.50
New Double Kr. Ld. Corr. Cuts	40.00/ 50.00	42.50/ 50.00	45.00/ 50.00	45.00/ 50.00
New 100% Kraft Corr. Cuts	55.00/ 60.00	50.00/ 60.00	60.00/ —	55.00/ 60.00
New Br. Kraft Env. Cuts	70.00/ 77.50	65.00/ 77.50	65.00/ —	70.00/ 75.00
New Br. Kr. Bag Waste Prntd.	70.00/ 77.50	65.00/ 75.00	65.00/ —	65.00/ 70.00
No. 1 Groundwood Shvs.	20.00/ 25.00	25.00/ 30.00	22.00/ —	20.00/ 23.00
White Newsblanks	60.00/ 65.00	50.00/ 60.00	40.00/ —	60.00/ 65.00
No. 1 Soft Wht. Shvs., coated	60.00/ 70.00	70.00/ 80.00	60.00/ —	60.00/ 70.00
Hd. Wht. Shvs.	100.00/110.00	95.00/110.00	100.00/ —	100.00/105.00
Hd. Wht. Env. Cuts	120.00/130.00	110.00/125.00	105.00/ —	120.00/125.00
Col. Tab. Cards	45.00/ 55.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
Manila Tab. Cards, bales	75.00/ 85.00	80.00/ 85.00	75.00/ —	75.00/ 80.00
No. 1 Col. Ledger	35.00/ 45.00	40.00/ 50.00	45.00/ —	35.00/ 40.00
White Ledger	60.00/ 65.00	60.00/ 65.00	60.00/ —	57.50/ 65.00
Mixed Book & Mag.†	18.00/ 20.00	18.00/ 22.50	15.00/ —	18.00/ —
No. 1 Rep'd. Hvy. Books‡	25.00/ 35.00	25.00/ 35.00	30.00/ —	30.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

PRICES OF MATERIALS

Aluminum sulphate:		
cml. bags, c.l. wks.	cwt.	$1.85 / —
iron-free, c.l. wks.	cwt.	3.55 / —
Casein, acid prec.:		
dom. sh. pt. c.l.	lb.	.24 / .30
Arg. ex dock, duty paid		.17½/ .18
New Zeal. do.		.21 / .23
Caustic soda:		
c.l. wks. solid, 76%	cwt.	3.70 / —
flak. & grd. 400-lb. drums, c.l.		4.10 / —
liquid 50% tanks		2.55
liquid 70% tanks		2.65
China clay:		
dom. air-float, c.l. wks.	ton	10.00
water-washed, lump, filler	ton	11.00
coating	ton	17.60 /30.50
Imported, ex. ship	short ton	16.00 /30.00
Chlorine:		
single-unit tanks, works	cwt.	2.93 / —
multiple unit, 2-5 cars per yr.		3.83 / 5.00
Formaldehyde:		
USP, inh. dms. c.l. wks	lb.	.0666/ —
l.c.l., E. wks.	lb.	.071 / —
Lime:		
hydrated bags, wks.	tons	14.50 /15.50
Gum rosin:		
K, M, N, drms, c.l. Savan, cwt.		7.57 / 7.75
Rosin size:		
70%, gum & pale grds., tank cars, south, sh. pt.	cwt.	6.60 / 6.65
Salt cake:		
dom. bulk, c.l. wks.	ton	19.00 / —
Soda ash:		
light, 58%, bags, wks.	cwt.	1.65
bulk	cwt.	1.35
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt.	1.00 / —
drums, c.l. wks.	cwt.	1.35 / —
42° Be. WW,		
tank-cars, wks.	cwt.	1.60 / —
drums, c.l. wks.	cwt.	1.95 / —
Sodium peroxide:		
dms. c.l. E. of Miss.	lb.	.186
l.c.l. do	lb.	.191 / .201
Soybean, protein:		
chem. isol., wks. c.l. bags	lb.	.25 / .25½
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt.	1.75 / 2.00
l.c.l. wks.	cwt.	2.30 / 2.45
tank-cars, wks.	ton	16.30 /18.60
Sulphur:		
crude, c.l. mines, contract,	long ton	25.50 /27.50
f.o.b. vessels Gulf	do.	27.50 /30.50
Sulphur dioxide:		
liquid, coml. cyl., wks.	lb.	.09
multi-unit cars	lb.	.0535
Starches:		
corn, multiwalls, c.l. prod. plant:		
pearl	cwt.	6.39 / —
white, dextrines	cwt.	7.78 / —
chlorinated	cwt.	8.14 / —
potato, Idaho, c.l. wks. W.	cwt.	5.80 / —
East, fr. all. 50 cents	cwt.	
potato, Maine, f.o.b. wks.	cwt.	6.25 / — nominal
Talc:		
domestic, sacks, c.l. wks.	ton	25.00 /30.00
Titanium dioxide:		
anatase, c.l. deld. E. bags	lb.	.22½/ .23
l.c.l. deld.	lb.	.23½/ .24
rutile, c.l. deld.	lb.	.24½/ .25
l.c.l. deld.	lb.	.25½/ .26

NEWS OF SUPPLIERS

S. Weinste'n

• NIAGARA FILTERS DIV., American Machine and Metals, Inc., has appointed Seymour Weinstein technical director.

He was formerly central district sales manager for Niagara with headquarters in Chicago.

J. Walter Bird will take over Niagara Filters sales representation in the Chicago area. Mr. Bird is currently Chicago sales representative of the Tolhurst Centrifugals Division of American Machine and Metals and will continue also in that capacity.

L. J. Wolfe

• PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. has appointed Lester J. Wolfe Chicago District sales manager. Prior to joining PICCO as a sales executive last August, he was assis'ant manager of sales of General Chemical Division, Allied Chemical & Dye Corp.

• CHEMICAL LININGS, INC., which installs and designs acid and chemical resistant linings for chemical pulp plant and other industrial linings, will erect a building on property purchased from Jefferson County on the Watertown-Glen Park Rd., Watertown, N. Y.

• JACKSON AND CHURCH CO., Saginaw, Mich., has appointed Homad Services, Ltd., Montreal, Canada, as manufacturer's representative in Central and Eastern Canada.

Homad will represent J-C's Zenith pulp presses and Roto-pulper mixer-shredder-refiner machines, used for high density bleaching, de-inking, washing and other pulp processing applications.

• PENNSYLVANIA SALT MFG. CO.'s Corrosion Engineering Products Dept., has appointed Joseph S. McCulloch manufacturer's representative.

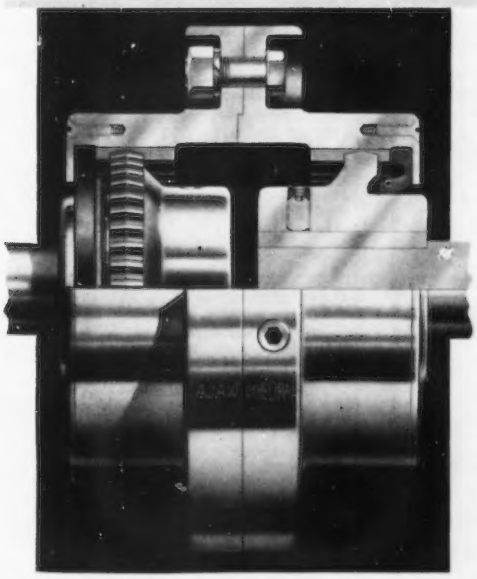
Mr. McCulloch has had more than twelve years of technical and sales experience in the corrosion engineering field.

In his new assignment, Mr. McCulloch will represent Pennsalt as sales engineer for chemical-proof cements, acid-proof mortars, chemical-resistant membranes, and corrosion-resistant coatings. His territory will cover Maryland, Delaware, Eastern Pennsylvania and Southern New Jersey.

NOW FOURDRINIER MACHINE OPERATORS can change the wire without disconnecting shaft at drive end

AJAX DIHEDRAL FLEXIBLE COUPLINGS

pay for themselves in Paper Mills and Converting Plants



Men responsible for tonnage are welcoming Ajax Dihedral Couplings because of their proven ability to reduce down-time.

- They handle misalignment heretofore considered impossible.
- They save line-up and change-over time.
- Seals keep lubrication in and corrosive liquids out.
- Simplify drive of adjustable and oscillating rolls.
- Maintain uniform peripheral speed on all wet and dry operations from blanket rolls to slitting and winding machines.

Also manufacturers of standard Ajax Rubber-Bronze Bushed Couplings.

Write for Catalogs

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, N. Y.

CHAS. T. MAIN, INC.
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Process Studies, Design, Specifications and Engineering Supervision
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Reports, Consultation and Valuations
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Consulting Engineers to
The Pulp and Paper Industry
Since 1929

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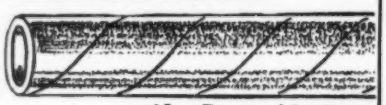
Non-Returnable, Durable standard mill core.

GARTEX

Returnable and Non-Returnable extra strong mill core for regular and special needs.

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TRENTON, NEW JERSEY
Sales Offices:
NEW YORK OFFICE, 500 5TH AVE.
PHILA., PA., PHONE MARKET 7-3313
J. E. FRICKE CO.

Emerson N. Glauner, Sr., at right, has been appointed to the position of sales manager; Jacob V. Edge, center, to assistant sales manager in charge of building board machinery; and R. W. Polleys, left, to the position of assistant sales manager in charge of stock preparation equipment of Downingtown Manufacturing Co.

• FAIRBANKS, MORSE & CO., Chicago, has organized a new "Electronics Division" for the company. This division will be responsible for research, development, application engineering, and manufacture of electronic devices and apparatus used in conjunction with various Fairbanks-Morse products, principally scales.

L. J. Maguire, formerly general manager of the St. Johnsbury, Vt., Works, has been appointed manager of this new division. His offices will be located in Davenport, Iowa, where the company already has a scale research group in operation.

• OAKITE PRODUCTS, INC., manufacturers of industrial cleaning and related materials, have assigned the following new technical service representatives:

Richard J. Price, to the Portland, Ore., area; Malcolm N. Gray, Lincoln, Nebr.; John N. Lee, Miami, Fla.; Gale R. Miller, Cincinnati, Ohio; Kenneth L. Oliver, Fort Wayne, Ind.; Thomas D. Ellsworth, Grand Rapids, Mich.; D. O. Mundale, Asheville, N. C.; Haskell Wilder, LaCrosse, Wis.; Lloyd W. Kagley, Knoxville, Tenn.; William D. Hudson, Topeka, Kansas; and Henry W. Dieter, Youngstown, Ohio.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Mar. 20	Mar. 27	Apr. 3	Apr. 10	Apr. 17
1954	93.6	93.6	94.1	94.6r	94.3
	Mar. 21	Mar. 28	Apr. 4	Apr. 11	Apr. 18
1953	95.2	93.9	91.3	91.1	93.6

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	94.5	94.6	94.4	92.7	93.9	93.8	82.2	94.7	92.7	97.2	94.6	82.8	92.3
1954	94.2‡	94.5‡	93.7‡										

COMPARATIVE YEARLY SUMMARIES

	1947	1948	1949	1950	1951	1952	1953	1954
Year to Date	104.9	100.5	91.7	95.1	101.3	96.6	94.4	94.1
Year Average	101.7	92.1	83.7	95.8	98.0	88.6	92.3	

‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS†

	Mar. 20	Mar. 27	Apr. 3	Apr. 10	Apr. 17
1954	92	90	89	89	91
	Mar. 21	Mar. 28	Apr. 4	Apr. 11	Apr. 18
1953	95	94	95	90	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1953	91	95	95	95	96	93	81	98	94	97	94	79	93
1954	89	89	90										

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

PAPER TRADE JOURNAL CLEARING HOUSE PAPER TRADE JOURNAL

RATES FOR ADVERTISING (PAYABLE IN ADVANCE) $.75 cents per line (6 words to line) minimum charge $3.75
—Additional charge of 70 cents if box number is used
Situation wanted advertisements can be repeated for ½ rate
Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼)
Address replies to advertisements appearing under Box Number in care of
PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.

HELP WANTED

CONFIDENTIAL EMPLOYMENT SERVICE

For paper and pulp mills and paper converting plants. Our service is rendered without charge to employers seeking executives. No charge to applicant until position is accepted. We invite your inquiries.

CHARLES P. RAYMOND SERVICE, Inc.
Phone: Liberty 2-6547
294 Washington St., Boston 8, Mass. A-30

WANTED
Chemist or Chemical Engineer

Opportunity available for Chemist or Chemical Engineer in a mill making Bleached Soda and Sulphite Pulp, also Chlorine and Caustic. Mills located in Maine. Send resume of educational background and experience. Experience desirable but not necessary. Address reply to Penobscot Chemical Fibre Company, Great Works, Maine. M-7

Chemist, B. S.

Opportunity in Packaging Control Division of Food Mfr. in New York City. Work on testing of adhesives, waxed paper, cellophane, paperboard, evaluation of completed packages. Modern, well-equipped laboratory, air-conditioned. Five day — 32½ hr. week. Liberal benefits. One year's experience in packaging desirable. Box 54-154 care Paper Trade Journal. A-30

SUPERINTENDENT OF FINISHING

Eastern Pulp and Paper Manufacturer has opening for a Superintendent of Finishing. Should have 8 to 10 years' experience supervision of modern high-speed Rotary Cutters, Press Cutters and Automatic Sealing Machines, finishing Sulphite specialties. Attractive working and living conditions. Applicants should be between 30 and 45 years of age. Salary will be commensurate with experience and background. Our employees are aware of this ad. Reply to: "Paper Trade Journal", Box Number 54-156.

MECHANICAL ENGINEER WANTED

Graduate Mechanical Engineer experienced in pulp and paper maintenance for large progressive mill in Middle Atlantic States. Under 35 years of age. Good salary with excellent opportunity for advancement. Give detailed resume of experience. Address Box 54-151 care Paper Trade Journal. A-30

WANTED—Experienced Machine Tender for Tissue Mill. Plant located in Pacific Northwest. Address Box 54-142 care Paper Trade Journal. M-14

WANTED — Experienced Finishing Supervisors for wax paper or tissue. Plant located in Pacific Northwest. Please address reply to Box 54-164 care Paper Trade Journal. M-21

HELP WANTED

PERSONNEL SERVICE ASSOCIATES

115 STATE ST., SPRINGFIELD 3, MASS.
TEL. 6-4749

Confidential Placement Service for the Pulp, Paper and Converting Industries. Administrative—Technical—Production—Sales. We endeavor to establish satisfactory contacts for employers and employees. Inquiries welcome. A-30

Packaging Chemist, B. S.

Two to five years experience in laboratory evaluation of flexible packaging materials for food products. Knowledge of printing inks helpful. Position available in Packaging Research Section of modern food laboratory on projects on paperboard, coatings, package testing. Located New York City, liberal benefits, 32½ hrs., five day week. Box 54-155 care Paper Trade Journal. A-30

MECHANICAL ENGINEER WANTED

Graduate Mechanical Engineer experienced in the operation of Fourdrinier paper machines, refining and related equipment for large progressive mill in Middle Atlantic States. Under 35 years of age. Good salary with excellent opportunity for advancement. Give detailed resume of experience. Address Box 54-150 care Paper Trade Journal. A-30

WANTED
Pulp and Paper Machinery Manufacturer's Agent or Representative for the Pacific Coast. Reply to Box 54-148 care Paper Trade Journal. M-7

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. 663 Brisbane Bldg., Buffalo 3, N. Y. A-30

WANTED—A mechanic or industrial engineer having heavy industrial experience in the paper industry to work on production problems of aggressive tissue paper company in the East. Excellent salary and opportunity. Address Box 54-137 care Paper Trade Journal. A-30

WANTED—Master Mechanic for large Writing and Printing paper mill in Middle Atlantic States. Must be experienced in paper mill work and be an able supervisor. Engineering degree preferred. Good salary. Address Box 54-136 care Paper Trade Journal. A-30

TECHNICAL sales representative to represent newly developed wet strength and other paper additives for well-known National firm. Must have laboratory experience. Address Box 54-127 care Paper Trade Journal. A-30

SALES REPRESENTATIVE: Experienced in selling Resin Coated and Printed Paper. Knowledge of specialty bags helpful. Age 30 to 45. Progressive company—opportunity for advancement. Salary open—liberal management benefits. Send complete resume with recent snapshot to Box 53-423 care Paper Trade Journal. TF

For Sale

Dryers
10—Rice Barton Dryers, 48" dia., 124" face.
10—Black-Clawson Dryers, 42" dia., 130" face.
8—Rice Barton Dryers, 48" dia., 98" face.
11—Black-Clawson Dryers, 36" dia., 114" face.
7—Black-Clawson Dryers, 36" dia., 82" face.
32—Sandy Hill Dryers, 36" dia., 73" face.
38—Black-Clawson Dryers, 48" dia., 46" face.
1—Rice Barton Dryer, 36" dia., 103" face.
3—Sandy Hill Dryers, 36" dia., 104" face.
1—Pusey & Jones Dryer, 48" dia., 104" face.
2—Bagley & Sewall Dryers, 28" dia., 120" face.

Calender Stacks
2—8-Roll, 82" face Black-Clawson
1—7-Roll, 72" face Farrel Birmingham.
1—3-Roll, 62" face Farrel Birmingham.

Reels
1—84" Bagley & Sewall Pope Type.
1—96" Bagley & Sewall Pope Type.
2—76" Black-Clawson two-spool Reels.
1—88" Smith & Winchester 2-spool Reel.
1—112" Bagley & Sewall 2-spool Reel.

Winder & Slitters
1—84" Cameron, Type 10, Model A with backstands.
1—86" Johnstone (New in 1949).
1—86" Langston, will make 50" dia. rolls.
1—118" Beloit (anti-friction bearings), motor drive.
1—109" Pusey & Jones, anti-friction bearings.
1—120" Pusey & Jones, anti-friction bearings.
1—194" Trim Beloit, was running 2350 F.P.M.
1—74" Bagley & Sewall, two-drum.
1—78" Moore & White, 4-drum.

Trimmers & Sheeters
1—84" 20th Century Seybold Trimmer, rebuilt.
1—76" 20th Century Seybold Trimmer, rebuilt.
1—48" Oswego, (Very reasonable).
1—82" Hamblet Rotary Sheeter.
1—76" Hamblet Rotary Sheeter, with backstands.

Beaters & Jordans
1—Dilts Breaker Beater, Keyed Bandless Roll, 72" dia., 60" face, cast iron tub 35" long, 3000# capacity (new bars and stands).
1—E. D. Jones 25# Laboratory Beater, roll bronze filled.
2—1800# Valley Iron Works, cast iron tubs.
1—800# Valley Iron Works (new bronze fillings).
3—Dilts Keyed Bandless Rolls, steel spindles, alley bars, with or without tubs.
1—E. D. Jones, 2000# capacity, roll 67 x 60".
1—E. D. Jones, 53" dia., 48" face beater roll. New 1949, 2 Sets New Fillings (A buy).
1—Noble & Wood Pony Monarch Jordan, anti-friction bearings, designed for direct connecting. New fillings.
2—Noble & Wood Pony Jordans, belt driven.
1—Noble & Wood Pony Monarch Jordans, B.D.
1—Appleton No. 1, designed for direct connecting.

Pumps
1—No. 8 Nash Hytor with Motor.
2—No. 6-L Nash Vacuum Pumps (like new).
1—No. 5-L Nash Vacuum Pump, all bronze.
1—No. 3 Nash Hytor, (new rotor & bearings).
4—Beloit, 10" to 8" low head Fan Pumps.
2—10" x 20" Shartle Triplex Plunger Pumps.
1—8" x 20" Beloit Triplex Plunger Pump.
4—3" x 8" Moore & White Duplex Plunger Pumps.
1—9" x 10" Deane Triplex Plunger Pump.
2—8" x 18" Shartle Duplex Plunger Pumps.
5—Warren Centrifugal Pumps, 3000 G.P.M.
1—Frederick, 12" x 8", 2700 G.P.M., 102 F.H.
3—Shartle Agiflow Stock Circulating Pumps.

Press Sections
1—Complete 84" Size Press.
1—Complete 84" Reverse Second Press.
1—Complete 84" Press and Pick-up felt.
1—Complete 120" Smoothing Press.
1—Complete 74" First Press.

Press Rolls
2—25" dia., 154" face, Suction Press Rolls.
6—16" dia., 82" face, R. C. Press Rolls.
3—16" dia., 82" face, brass covered Press Rolls.
3—17" dia., 77" face, R. C. Press Rolls.
2—17" dia., 77" face, brass covered Press Rolls.
3—17" dia., 149" face, R. C. Press Rolls.
2—17" dia., 149" face, brass covered Press Rolls.
1—28" dia., 148" face, R. C. Press Roll.
Just a few of the several hundred available.

Miscellaneous
7—42" dia., 144" face, Hollow Shaft Cylinder Moulds, anti-friction bearings.
2—30" dia., 76" face, Cylinder Moulds.
1—36" dia., 134" face, Cylinder Mould.
1—48" dia., 76" face, Cylinder Mould.
1—30" dia., 53" face, Cylinder Mould.
6—New Felt Stretches with 1-7/16" bronze screws.

"Every Pound of Paper is Made on Used Equipment."

OSBORNE PAPER MILL EQUIPMENT CORP.
FULTON, N. Y. **Tel. 2-4254**
A-30

HELP WANTED

ARE YOU A CONVERTER—and would you like a permanent connection wtih a mill in the middlewest, established for several years, making the highest grades of coated and uncoated boxboard? If so, please write at once to Box 54-162 care Paper Trade Journal. M-21

OHIO BOARD MILL requires chemical engineer or graduate pulp and paper. Under thirty five. Salary commensurate with qualifications. Submit complete information first letter. Address Box 54-160 care Paper Trade Journal. M-7

SITUATIONS WANTED

PRODUCTION SUPERINTENDENT

Twenty-five years of practical experience on large rapid running eight-cylinder machines manufacturing high grade folding boxboard & frozen food cartons of all kinds from virgin pulp and old paper stock. Aggressive, capable man, references. Address box 54-152 care The Paper Trade Journal. M-7

SALES ENGINEER

9 years experience with large midwest company contacting variety of industries including many paper mills throughout country. Experience price estimating, field testing, preparation sales promotion literature. Registered Engineer Wis. Age 30. Will relocate but prefer midwest. Box 54-159, c/o Paper Trade Journal. A-30

SITUATIONS WANTED

Technical Director of Folding Cartons manufacturer (30), wishes to relocate with aggressive organization. Technical graduate, experienced in the solution of many types of production bottlenecks, such as de-inking, de-waxing, stream pollution, etc., etc. Salary: $10,000+. Box 54-145, care Paper Trade Journal. M-7

DESIGN, PRODUCT DEVELOPMENT & MANAGEMENT MAN

1. Management experience covers Personnel Handling & Negotiations, Purchasing, Art Work, Photography, Engraving, Rubber & Litho Plate Making, Litho, Letter Press, Rotogravure & Aniline Printing Procedures. Complete Manufacturing Storage & Shipping. Also actual installation of Work Measurement by Engineered Production Standards and Balanced-in-line Process Layouts, Mechanized Material Handling, Cost Estimating, Pricing, Cataloging Displaying, Correspondence and Customer Relations.
2. Product Development covers building lines of Commercial Envelopes, Stationery (Papeteri Boxed-Transparent Wrap) Multi-use Printed Forms, Ruled School Supplies (Banded Fillers, Wire Coil Bound, Sewed & Memo Books & Tablets), Zipper & Regular Binders.
3. Designing covers Paper Bag, Printing, Envelope, Embossing, Slitting, Rewinding, Rotary Cutting, Wire Coil Binding, Laminating & Gumming Machinery.

Address Box 54-153 care Paper Trade Journal. M-7

ADMINISTRATIVE MECHANICAL ENGINEER—37, with 15 years broad experience in engineering, supervision and equipment sales, all grades digester to reel, desires change for greater opportunity as operations supervisor or executive assistant. Address Box 54-161 care Paper Trade Journal. M-14

SITUATIONS WANTED

GENERAL MANAGER

of fully-integrated pulp and paper manufacturing company, now available as result of merger, seeks opportunity to demonstrate to small-to-medium-sized paper manufacturer methods used to achieve corporate earnings rate substantially above that of principal competitor and that of integrated industry nationally; available as consultant or on permanent basis. Address Box 54-167 care Papar Trade Journal. M-21

ASSISTANT TO AN EXECUTIVE IN CHARGE OF PULP PRODUCTION COSTS

Well versed in the new developments (involving the cleaning of rough woods, wood chips and pulps, and the most recent pulping and bleaching procedures) in the utilization of waste or rough woods without lowering the end-use qualities of standard pulps. Ph.D. training, presently employed, married. Strong background in applied research with some mill experience. Address Box 54-91 Paper Trade Journal. A-30

EXECUTIVE MANAGER—Paper, Board and Conversion; seeks Change for opportunity. Highly qualified in all phases of management; administration; and production. Address Box 54-140 care Paper Trade Journal. A-30

CONSULTANT—Engineer. Top grade bag man. Will instruct adjustors all repairs, manufacturing and mechanical problems, printing, trouble shooting, etc. Reasonable rates. Address Box 54-131 care Paper Trade Journal. M-7

SITUATIONS WANTED
Continued on page 42

FOR SALE

GRINDERS (Roll)
Farrel, takes roll 24" x 160".
Farrel, takes roll 36" x 161".
24" x 276" centers Landis.

GRINDERS (Slitter)
2—Koegel slitter grinders.

JORDANS
2—No. 1 Jones, new 1950, with base and coupling.
1—No. 2 Emerson Junior, base and coupling, new 1948.
1—No. 1 Emerson Junior, anti-friction, 5/16" steel filling.
2—Jones Majestic.
2—Shartle Miami No. 2.
3—Jones Imperial, 3/16" stainless steel filling.
4—Emerson Junior, No. 4, anti-friction bearings.
Noble & Wood Mammoth.
2—Noble & Wood Bulldog.
Union Machine, 1/4" stainless steel filling.
Noble & Wood Mammoth Senior.
No. 2 Emerson, anti-friction.
No. 1 Emerson. No. 1 B Emerson.
No. 1 Claflin with coupling and base.
Shartle No. 1 Hydrafiner with motor.
Four Cowles Claffiners.
3—Mastodon Jordans.

KETTLES
Glass lined, steam jacketed, 150 gallons.
Glass lined, 300 gallons.
82 x 22, Glass lined, jacketed.
2 Size tanks, 300 gallons, partially jacketed.
Autoclav, used one week, 10 lb. pressure.
24 x 24 steam jacketed, fifty gallons.
Steel tank, 10 ft. dia. x 10' 6".

KNIFE GRINDERS
102" Seybold, three new stones.
100" Hanchett. 40" Springfield.
64" Seybold. 66" Berlin.
30" Bridgeport.

KNOTTERS
2—Impco, print available.
3—Trimbley.

LAMINATING MACHINES
62" Beloit.
54" Laminator and Combiner.
62" Beloit.
106" Beloit, layboy and roll stands.
84" Moore & White, rebuilt.
56" Moore & White. 80" Moore & White.
94" 8-roll Moore & White, backstand, double deck, 36" roll.

MACHINE TOOLS
20" Simonds shaper.
36" Drill press.
32" Drill press.
Cincinnati No. 2 horizontal milling machine.
Pond engine lathe, 36".
Putnam lathe, 10' 6" center to center, swing 32, turns 22" from 36" bed, swings over bed 14".
Sellers planer 10' 6" x 28".

M. G. SETS
Allis Chalmers, 500 K W and controls.
Westinghouse, 100 K W.
Westinghouse 95.

MOTORS
2—G. E., 125 HP vertical squirrel cage, 550 V, 65 speed full load.
1—500 HP Westinghouse, 2300 V, 200 rpm, synchronous.
2—50 HP, 440 V. 4—100 HP, G. E., 50 V.

PULPERS
Kurt Wandell Dynapulper.
2—No. 2 Lannoye pulpers.

PUMPS (Centrifugal)
Gardner Denver, size 2½, Type EE, 350 gpm, 60 ft. head.
2300 gpm Gould, 14 ft. head with 30 HP, 440 V motor.
150 gpm Gould, 150 ft. head with 15 HP, 3600 rpm motor.
2—Frederick, 200 gallons, 80 ft. head, 25 HP, 1150 rpm, 440 V motor.
2—7500 gpm, 5 percent stock, 30 ft. head.
500 gallons, 120 ft. head, Warren.
4" x 5" Aurora, 400 gpm, 50 ft head.
500 gallon, 120 ft. head, Warren.
Jennings, 300 gallons, 35 ft. head.

PUMPS (Plunger)
7 x 16 Shartle duplex.
2—9 x 16 Downingtown, new 1951.
12 x 12 Gould triplex.
12 x 12 Bagley & Sewall triplex.
10 x 20 Black & Clawson triplex, 4 years old.
2—7 x 9 Gould.

PUMPS (Vacuum)
Nash A. L., 1 HP, 220-440 V motor.
No. 1 Nash. Nash L 6.
No. 2 Nash. Nash L 2.
No. 4 Nash.

RAG CUTTERS
Taylor Stiles Giant, size 2 B.
Perkins rag cutters Series C, No. 39.

REELS
Two bowl Rice Barton, 96".
62" Pusey & Jones drums, 42 x 162".
90" Pusey & Jones drums, 42 x 190".

REFINERS
32" Sutherland.
No. 1 Claflin with coupling and base.
4 Cowls Classifiners.
Weiner refiner.
No. 2 Haug refiner with No. 2 drainer.
No. 1 Shartle Hydrafiner, 150 HP, 440 V motor.
Shartle refiner No. 4.
Jeffrey Hammermill, size 24 with 40 HP motor.
3 Haug drainers, size 3. Morden stock maker.

SCREENS
2—Ten plate Impco, bronze vats.
1—Twelve plate Impco bronze vat.
1—Twelve plate Impco bronze vat.
1—Ten plate Sandy Hill roller shoe, new.
1—Ten plate Sandy Hill roller shoe, plates cut .012".
2—Fourteen plate Harmon.
2—Sixteen plate Packer.

SCREENS (Rotary)
4—Bird 2 A copper vats. 1—Jones Leith Walk.
1—Bird 3 A. 1—Trimbley Senior.

SCREENS (Pulp)
2—No. 4 Impco centrifugal.
2—No. 4 Impco centrifugal.
2—Trimbley.

SLICES
93" Voith. 153" Voith.153"
143" Rice Barton. 160" Beloit.
143" Voith, new. 206" Voith.

SLITTERS AND WINDERS
42" Cameron, type 6.
62" Cameron, type 95.
62" Meisel.
82" Cameron, type 10, model A.
82" Langston. 100" Type 18 Cameron.
106" Type 18 Cameron.
104" Moore & White four drum with slitter part, 7½ HP motor.
107" Moore & White, four drum, anti-friction.
146" Langston, Type D. A., anti-friction.
150" Rice Barton, two-drum, 15" dia. drums.
160" Black & Clawson, two-drum.
186" No. 19 Cameron.

ROLLS (Suction)
14½" x 99" Sandusky suction press.
14" x 100" Millspaugh suction couch.
18" x 100" Walmesley suction couch.
3—22" x 128" Downingtown suction extractor.
3—10½" x 138" Downingtown suction felt rolls.
18" x 104" Sandusky suction press.
25" x 152" Sandusky suction press.
30" x 158" Sandusky suction couch.
30" x 161" Downingtown suction couch.
30" x 170" Sandusky press.

TRIMMERS
38" Smith & Winchester.
44" Smith & Winchester, power operated back gauge.
44" Oswego. 54" Seybold, New 1940.
48" Seybold. 84" Smith & Winchester.
54" Seybold 84" Seybold.

WET MACHINES
72" Rogers anti-friction. 72" Rogers.
72" Rice Barton 84" Bagley & Sewall.

175 Richdale Avenue **FRANK H. DAVIS COMPANY** **Cambridge, Massachusetts**
TF

1—Sandusky Suction Press, 162" drilled face x 22" diameter with roller bearings.

FOR SALE

BARKING DRUM
1—10' x 30'.

BEATERS
2—1500 lb. Dilts iron tub beaters, rolls 52" diameter x 42" face.
1—Noble & Wood Beater roll and stand. 70" diameter x 44" face.
2—Breaker Beaters—52" diameter x 48" face rolls.
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54" x 48", cast iron tubs, with motors.
1—2000 lb. Breaker Beater, Valley Iron, iron tub.
Write us regarding your requirements.

BREAKER STACK
1—110" face 2 roll breaker stack, with frames.

CALENDER STACKS
1—4 roll 72" Calender Stack. (Extra heavy duty).
1—3 roll 60" Friction Calender Stack, Two iron rolls and 1 Paper or Cotton Roll.
1—5 Roll 86".
1—5 Roll 90".
1—9 Roll—86" face, Super Calender Stack.

CHIPPERS
1—88" Carthage 4 knife Chipper.
1—96" Murray 4 knife Chipper—anti-friction bearings.
1—84" Carthage 4 knife Chipper.

CLASSIFINER
1—Dilts Classifiner, practically new, with motor.

CORE MACHINES
1—Dietz Core Machine (Tube Winder).

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.

CYLINDER MOULDS
2—30" diameter x 72" face.
1—30" diameter x 92" face.
2—36" diameter x 54" face.
2—36" diameter x 84" face.
2—36" diameter x 86" face, with vats.
6—36" diameter x 110" face, with 24" diameter face couch rolls.
1—48" diameter x 117" face.
2—36" diameter x 136" face with anti-friction bearings.

DIGESTERS
2—14' Globe Rotary Digesters.

DRIVES
1—Jones Reducer 75 h.p.—30.8 to 1.
1—Jones 21—H.P., ratio 10 to 1.
1—#4 Reeves Drive.
1—Vaughn 100 H.P. enclosed drive Ratio 7 to 1.
2—Cleveland agitator drives, for chests.
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 h.p.).

DRYERS
1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
1—48" diameter x 70" face.
2—Dryers 48" diameter x 134" face.
1—28" diameter x 48" face.
1—36" diameter x 67" face.
2—36" diameter x 120" face.
1—48" diameter x 144" face.
5—28" diameter x 80" face with anti-friction bearings.
2—36" diameter x 72" face.
3—60" diameter x 86" face.
1—48" diameter x 100" face.
1—48" diameter x 106" face.
1—36" diameter x 90" face.
8—36" diameter x 44" face.
5—24" diameter x 54" face, with bearings.
2—48" diameter x 88" face. Frames, gears, bearings and felt equipment.
6—36" diameter x 76" face.
60—36" diameter x 73" face, gears and bearings.

EMBOSSING CALENDERS
1—15" 2 roll embosser.
1—40" 2 roll embosser, complete with unwind, rewind and motor.

EXTRACTOR ROLLS
1—Extractor roll, 26" diameter x 104" face, with rubber couch roll.
1—Rice, Barton & Fales Extractor Roll, 26" diameter x 104" face, with rubber couch roll.

FLAT SCREENS
2—12 plate Flat Screens.
2—14 plate Packer, roller shoes.
1—14 plate flat screen, Packer, roller shoes with scraping device, practically new screen.

GEARS
Write us regarding requirements.

GRINDERS
2—4 pocket Grinders.
2—3 pocket Grinders.

HEAD BOX & INLET
1—Valley Iron Works Inlet complete with head box, 156", all stainless steel.

HYDRAFINER
1—Dilts Hydrafiner with motor.

JORDANS
1—#2 Emerson anti-friction bearing.
1—#1 Emerson, iron plug, new spare filling.

LABORATORY EQUIPMENT
Write us regarding your requirements.

LAMINATING MACHINE
1—72" Hudson Sharp laminating machine, reverse coater.

MISCELLANEOUS
1—2 ton Philadelphia Chain Block.

MOTORS
3—150 H.P. Westinghouse 495 R.P.M. 3/60/440, with starter.
2—50 H.P. Upright motors, air cooled 3/60/440, 1150 RPM (Ball Bearing).
Write us regarding your requirements.

PRESSES
Write us regarding your requirements.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper.

PUMPS
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

RAG CUTTERS
2—#20 Taylor Stiles, complete with anti-friction bearings.
1—#20 Taylor Stiles Rag Cutter, with motor, including 20 sets of new knives.

REACTION CHAMBER
1—B. K. Reaction Chamber 18" screw feed, stainless clad.

REELS
1—86" 2 bowl reel.
1—84" 3 bowl revolving reel.
1—123"—3 bowl revolving reel.
1—134"—2 drum.
1—72" Downingtown Reel, 2 bowl.

REFINERS
1—12" Wiener Refiner.

ROLL HEADING MACHINE
1—Montague header, with air cylinders, heating element, etc., for up to 36" diameter by 82" long roll.

ROLLS
1—Rubber Couch Roll—20" diameter x 108" face.
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)
5—Rubber Couch Rolls—24" diameter x 110" face.

ROTARY SCREENS
1—Bird, 36" diameter cylinder x 50" long plate, enclosed drive.
Write us regarding your requirements.

SAVEALLS
4—Thompson Washers 36" x 110" cylinder, molds, 24" diameter rubber couch rolls.
2—Savealls 36" diameter x 136" face, hollow shaft cylinder molds, anti-friction bearings, iron end vats. Very good condition.
2—Sandy Hill, 36" diameter x 86" face cylinder molds, anti-friction bearings and couch rolls.

SHAKER ROLLS
1—134" face x 14" diameter with Messenger bearings.
1—104" face x 14" diameter with Messenger bearings.

SHEETERS
1—100" Moore & White "Simplex" with layboy.
1— 72" Hamblet Sheeter.
1—140" Hamblet (Simplex).
1—140" Hamblet (Duplex).
1—62" Moore & White Sheeter, layboy, 8 roll back stand.

SHOWERS
5—Bird showers 96" face.

SHREDDER
1—#5 Taylor Stiles "Giant" Pulp Shredder.

SLITTERS & WINDERS
1—26" Cameron—Type 10.
1—36" Cameron—Type 44-W (Winder only.)
1—52" Cameron—Type 6.
1—56" Cameron—Type 24-2A.
1—62" Cameron—Type 10.
1—62" Cameron—Type 40-1-AF.
1—72" Cameron—Type 10.
2— 84" 4 drum Moore & White.
2— 86" Two Drum Moore & White, 50" diameter rewind.
1—104" Beloit two drum winder.
1—106" Cameron—Type 18.
1—108" Sandy Hill winder.
1—118" Beloit 2 drum winder.
1—120" Moore & White, 4 drum winder.

STOCK PUMPS
1— 8 x 18 Shartle Duplex.
2—10 x 10 Beloit Duplex, low type.
1— 8 x 18 Shartle Triplex.
2—10 x 20 Shartle Triplex.
1—12 x 20 Shartle Triplex.
Advise as to your requirements.

SUCTION BOXES
Write us concerning your requirements.

SUCTION PRESS ROLLS
1—Sandusky Suction Press Roll 130" drilled face x 14⅜" diameter.

TABLE ROLLS
9—154" face x 5" diameter (Brass)
8—148" face x 5" diameter (Brass)
10—150" face x 5" diameter (Aluminum)
Write us regarding your requirements.

THICKENERS
1—Sandy Hill Thickener, all Stainless Steel, mold 60" x 101" face, with couch roll. Anti-friction bearings throughout.
1—Pulp Thickener, cylinder mold 48" x 117", with spare cylinder mold.

TOILET WINDERS
2—72" Hudson-Sharp (Surface type winder).
4—81" Dietz.

TRIMMERS
1—44" Sheridan.
1—60" Guillotine cutter.

VACUUM PUMPS
1—#8 Nash Hytor.
1—#9 Nash Hytor.
1—N-82 Nash, for Fulton-Midwest System
1—#6 Nash Hytor "Bronze."

VIBRATING SCREEN
1—Tyler Niagara Vibrating Screen, practically new.

WAXING MACHINE
1—65" Mayer Waxing Machine.

WET MACHINE
1—72" Wet Machine.

YANKEE DRYERS
1—106" x 72" diameter.

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FOR SALE

MAINTENANCE MACHINE TOOLS

These tools are all in good running condition and are a good investment for repair and maintenance work.

36" Smith and Mills Shaper, New 1951. Bought for special job with many attachments. Rapid traverse throughout, tool lifters, feed in all directions. $6,500

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24" Bullard Vertical Turrett Lathe (2 available) 1 turrett head. 10 HP 60 cycle AC ea. 1,300

Oliver 3" Cup Twist Drill Grinder 100

16 x 54" Lodge & Shipley Engine Lathe Quick change 220/440 V AC, motorized 700

J & L Flat Turrett Lathe. Steel head. Complete bar equipment 600

Davis 18 x 48 Engine Lathe. Quick Change 220/440V AC, motorized 600

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for
PAPER COATING
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P. O Box 774

KALAMAZOO, MICHIGAN

A-30

FOR SALE—1—74" Seybold Dayton Mill type Power Cutter. THOMAS W. HALL COMPANY, Stamford, Conn. M-7

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Roll widths up to 56"

Plant located in Chicago.

PAPER CONVERTING & FINISHING CO.

118 N. Ada St., Chicago 7 Ill.

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110" Hamblet Sheeter.
60" Finlay Sheeter.
40" Clark Single Sheeter.
48" Kidder model CH Slitter.
28" Hobbs shear cut Slitter.

BACK-STANDS, ANY SIZE, MADE TO ORDER

Thomas W. Hall Company, Inc.
120 West 42nd St., New York 36
(Plant at Stamford, Conn.)

TF

FOR SALE—One—48" Holyoke 3 Roll Calendering Machine in first class condition. THOMAS W. HALL COMPANY, STAMFORD, CONN. A-30

FOR SALE—80" Creper an Waxer complete with Steam Plant. All new equipment. Address Box 53-293 care Paper Trade Journal. TF

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WANTED—#5 heavy duty Lockport square and flat machine. Address Box 54-166 care Paper Trade Journal. M-7

WANTED—Satchel bottom machine to manufacture up to 3 wall bags—in size at least 20" wide, 37" long, 7" bottom. Address Box 54-165 care Paper Trade Journal. A-30

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U. S. Rubber Co.

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Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
E. I. du Pont de Nemours & Co., Inc.
Rohm & Haas Company
Virginia Smelting Co.

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Jackson & Church Co.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
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Murray Mfg. Co., D. J.
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BLOWERS
Buffalo Pumps, Inc.
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The Place To Increase Beater Production Is In Your Rag Cutters

The rag cutter shown here is a single 520 Taylor-Stiles machine that cuts and cross cuts the rags in making roofing felt. Note feed apron is piled high with rags. The machine cuts loads like this smoothly and without interruption.

Beaters produce more in any given time if the rags fed into them are cut evenly and to small pieces, leaving less work for the beaters to do in tearing apart the fibers for pulp.

TAYLOR-STILES RAG CUTTERS

—for manufacturers of fine writing or roofing papers cut full loads of rags, hour after hour, and day after day, with low costs in power and maintenance.

Let us know your rag cutting requirements for facts about the cutter to meet them efficiently.

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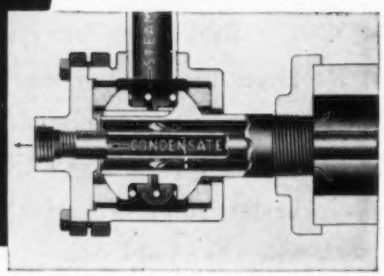
NEW TYPE J Johnson Joint

Johnson Type J Rotary Pressure Joint more than ever pays its way...



For putting steam in, taking condensate out, Johnson Joints have written an unequalled service record—have been adopted almost unanimously by machinery manufacturers. Now better than ever, the new Johnson Type J Joint weighs less, is smaller, costs less, has new style carbon-graphite seal rings giving an average of 25% greater wear. As before, it's packless, self-lubricating, self-adjusting to varying pressures, easy to service or repair right in the field. The new Type J Joint has simplified head design to permit condensate outlet connection in any direction. The inlet is now on the side of the body, which makes easier both the piping hook-up and the proper centering of the Joint. There's provision for special assembly plate to make easy removal of modern mechanical syphon pipe. Get the facts.

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Sandy Hill Iron & Brass Works

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James Leffel Co.

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Gus Reidel & Son

BRUSHES
M. W. Jenkins Sons, Inc.
Gus Reidel & Son
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Testing Machines, Inc.

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The Moore & White Co.
Perkins & Sons, Inc., B. F.
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

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Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
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Link Belt Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICAL SPRAYS
Vapo Systems Co.

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Antara Chemicals Division, General Dyestuff Corp
Arnold, Hoffman & Co., Inc.
Calgon, Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Heyden Chemical Corp.
Hooker Electrochemical Co.
Koppers Company, Inc.
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Monsanto Chemical Company
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Wyandotte Chemicals Corp., J. B. Ford Division

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Beloit Iron Works
Black Clawson Company
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Downingtown Mfg. Co.
Farrel-Birmingham Co.
Horton Mfg. Co., Inc.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
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Shartle Bros. Mch. Co.

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The Mayer Machine Co., Inc.
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Potdevin Machine Co.
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Shartle Brothers Machine Co.
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Weber, Herman G., & Co., Inc.

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The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Thiele Kaolin Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Westinghouse Elec. Corp.

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Aluminum Co. of America

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DeZurik Shower Company
Pandia, Inc.

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Rust Engrg. Co
J. E. Sirrine & Co.
Vapo Systems Co.
John Waldron Corp.

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CONTROLS
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Johnson Corp.
Poirier Control Co.
Ronningen-Petter Co.
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Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co
Potdevin Machine Co.
Waldron, John, Corp.

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Enterprise Company
Jeffrey Mfg. Co.
Link Belt Co.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O
Shartle Brothers Machine Co

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Mead Board Sales, Inc.
Mercer Paper Tube Co.
Sonoco Products Co.

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Tyer Rubber Co.

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Whiting Corp.

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Moore & White Co.
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The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
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Downingtown Mfg. So
Improved Machinery Inc.
Manchester Machine Co.

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Dilts Machine Works
The Sandy Hill Iron & Brass Works
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Calgon, Inc
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

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Antara Chemicals Division, General Dyestuffs Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

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Blaw Knox Company
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Pandia, Inc.
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Custom-built machines for makers of paper and paperboard

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Nopco Chemical Co.
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Wyandotte Chemicals Corp.
Michigan Alkali Div.

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Simonds Saw & Steel Co.
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Shartle Brothers Machine Co.
Valley Iron Works Co.

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Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

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Bird Machine Co.
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Downingtown Mfg. Co.
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Horton Mfg. Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
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Manchester Machine Co.
Moore & White Co.
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Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Downingtown Mfg. Co.
Manchester Machine Co.

DRYER ROLL PYROMETER
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M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

DUSTING BRUSHES
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E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.

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Testing Machines, Inc.

ELECTRIC HYGROMETER
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Hudson Sharp Machine Co.
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Rohm & Haas Company
Wyandotte Chemicals Corp.

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Ronningen-Petter Co.

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Huyck & Son, F. C.
Knox Woolen Company
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Williams-Gray Co.

FELT CLEANERS
Antara Chemicals Division, General Dyestuff Corp.
Calgon, Inc.
Nopco Chemical Co.

FELT CONDITIONERS
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Downingtown Mfg. Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Barss Works

FELT EXPANDERS
Mount Hope Machinery Co.

FELT GUIDES
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Downingtown Mfg. Co.
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FELT PRESERVERS
Mount Hope Machinery Co.

FELT SHOWERS
Ronningen-Petter Co.

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FIBRE GLASS
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A. M. Meincke & Son, Inc.
Thiele Kaolin Co.
Vanderbilt Co., R. T.
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Shartle Brothers Machine Co.

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Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Johnson Corp.
Moore & White Co.
Ronningen-Petter Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Walworth Company

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Bird Machine Company

FILTER SCREENS
Ronningen-Petter Co.

FINE SCREENS
Bird Machine Company
Sandy Hill Iron & Brass Works

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Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
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Walworth Company

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Shartle Brothers Machine Co.
John Waldron Corp.
Westinghouse Electric Corp.

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Norton Co.

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Walker Process Equipment, Inc.

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Shartle Brothers Machine Co.

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Thwing-Albert Instrument Co.

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Downingtown Mfg. Co.
Manchester Machine Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

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GEAR REDUCER DRIVES
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Moore & White Co.
D. J. Murray Mfg. Co.
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Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
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Parsons & Whittemore
Potdevin Machine Co.

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Wellman Engrg. Co.

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Blaw-Knox Co.

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Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Hanchett Mfg. Co.
Lobdell United Co.
Norton Company
The Sandy Hill Iron & Brass Works

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Norton Company
Simonds Abrasive Co.

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The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

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Hercules Powder Co., Inc.
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HEAT EXCHANGERS AND RECOVERY SYSTEMS
Mahon, R. C., Co.
Westinghouse Electric Corp.

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E. D. Jones & Sons Co.
General Electric Co.
Jackson & Church Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Westinghouse Electric Corp.

HONING KIT
John W. Bolton & Sons, Inc.

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Kalamazoo Sheet Metal Mfg. Co.

HOSE (Air, Water, Suction, etc.)
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The Goodyear Tire & Rubber Company

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Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

HYDRAULIC OSCILLATING SHOWERS
Ronningen-Petter Co.

HYDRAULIC TURBINES & ACCESSORIES
James Leffel Co.

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American Cyanamid Company, Industrial Chemicals Division
Sun Oil Company
B. F. Goodrich Chemical Co.

INDENTING MACHINES
Dilts Machine Works

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Westinghouse Electric Corp.

INDUSTRIAL TIRES
B. F. Goodrich Co.

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

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Taylor Instrument Cos.

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Tracerlab, Inc.
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Insul-Mastic Corp. of America

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Beloit Iron Works
Cram Associates
Downingtown Mfg. Co.
Johnson Corp.
Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

JORDAN BARS
Ronningen-Petter Co.

JORDANS
Emerson Mfg. Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Bros. Manufacturing Co.
John W. Bolton & Sons, Inc.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KILNS
Jackson & Church Co.
F. L. Smidth & Co.

KNIVES
Black Clawson Company
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
Black Clawson Company
Improved Machinery, Inc.
Sandy Hill Iron & Brass Works

LABORATORY CORRUGATOR
Testing Machines, Inc.
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
Bird Machine Company
Cady & Co., E. J.
Dilts Machine Works
Downingtown Mfg. Co.
W. & L. E. Gurley
Egan, Frank W., & Co.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Ronningen-Petter Co.
Shartle Brothers Machine Co.
Taylor Instrument Companies
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Valley Iron Works Co.
Waldron, John, Corp.

LAMINATING MACHINES
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co.
Potdevin Machine Co.
Waldron John, Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LINTER PULP
Hercules Powder Co., Inc.

LUBRICANTS
Cities Service Oil Co.
Gulf Oil Corp.
Houghton & Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
The Texas Company

MACHINERY, CARBON PAPER
Haida Engineering Co.

MAGAZINE REELS
Dilts Machine Works

MAGNETIC SEPARATORS
Bauer Bros. Co.
Emerson Mfg. Co.
Shartle Brothers Machine Co.

MATERIALS HANDLING
Dilts Machine Works
Downingtown Mfg. Co.
Jeffery Mfg. Co.
Link Belt Co.
Shartle Bros. Mch. Co.
Towmotor Corp.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
Cady & Co., E. J.
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MIXERS
Jackson & Church Co.
Mixing Equipment Co.
Walker Process Equipment, Inc.

MICRO-CRYSTALLINE WAXES
Sun Oil Company

MOISTURE CONTENT CONTROL
Testing Machines, Inc.
Vapo Systems Co.

MOISTURE METERS
Testing Machines, Inc.

MOTORS
Allis Chalmers Mfg. Co.
Elliott Company
Moorhead Elec. Machy. Co.

MOTORS AND GENERATORS
Elliott Company, Inc.
General Electric Company
Moorhead Elec. Machy. Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corp.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Shartle Brothers Machine Co.

PAPER CONDITIONERS
Vapo Systems Co.

PAPER MACHINE DRIVES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Dowington Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Westinghouse Electric Corp.

PAPER MACHINES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Manchester Machine Co.
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER MILL MACHINERY
Ronningen-Petter Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Paper Converting Machine Co.

PARAFFINE WAXES
Sun Oil Company

PARAFFIN WAX EMULSIONS
American Cyanamid Co., Ind. Chem. Div.
Arnold, Hoffman & Co., Inc.
Hercules Powder Co., Inc.
Nopco Chemical Co.

PASTING MACHINES
Beloit Iron Works
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

PEBBLE MILLS
F. L. Smidth & Co.

pH METERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PHOTO GRAVURE ROLLS
Stone, Thos. & Geo. M., Inc.

PIPE
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
Babcox & Wilcox Co.
Crane Company
Grinnell Company
National Tube Co.
Walworth Company

PIPE FABRICATORS
Pittsburgh Piping & Equipt. Co.
Ronningen-Petter Co.

PIPE FITTINGS
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Walworth Co.

PIPING, HIGH PRESSURE
Pittsburgh Piping & Equipt. Co.

PIPING (Pliowald Lines)
Goodyear Tire & Rubber Co.

PITCH CONTROL
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company

PLASTICIZERS
American Cyanamid Company Industrial Chemicals Company
Aktivin Division, Heyden Chemical Corp.
Arnold, Hoffman & Co., Inc.
B. F. Goodrich Chemical Co.
Jackson & Church Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Company

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
Emerson Mfg. Co.
Luxenweld Division
Lukens Steel Company
L. O. Ross Engrg. Corp.
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black Clawson Company
Emerson Mfg. Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Black-Clawson Company
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

PRESERVATIVES
Antara Chemicals Division, General Dyestuff Corp.
E. I. du Pont de Nemours & Co.

PRESS ROLLS
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Goodrich, B. F., Company, Inc.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Stowe-Woodward Inc.

PRESSURE FILTERS
Holyoke Machine Co.
Hungerford & Terry, Inc.
Jackson & Church Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works

PRESSURE VESSELS
Chicago Bridge & Iron Co.
Mahon, R. C., Co.
A. O. Smith Corp.

PRESSES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Heinrich, H. H., Co.
Hudson-Sharp Machine Co.
Jackson & Church Co.
Manchester Machine Co.
The Moore & White Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Testing Machines, Inc.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.

PRINTING ROLLS
Stone, Thos. & Geo. M., Inc.

PROTECTIVE COATINGS
Insul-Mastic Corp. of America

PULLEYS
Bird Machine Company
Black-Clawson Co.
Dodge Mfg. Corp.
Horton Mfg. Co., Inc.
Sandy Hill Iron & Brass Works

PULP CLASSIFIER
The Bauer Bros. Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PULP CLEANERS
Bauer Bros. Co.
Bird Machine Co.
Nichols Engrg. & Research Corp.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP REFINERS
Emerson Mfg. Co.
Shartle Bros. Machine Co.

PULP SCREENS
Bird Machine Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP STOCK VALVES
Crane Company
Grinnell Company
Murray, D. J., Mfg. Co.
Record Fdy. & Mach. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

PULP WASHERS
Mundt, Chas. & Sons
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULPERS
Apmew, Inc.
Bauer Brothers Co.
Cowles Company
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
Shartle Brothers Machine Co.

PULPS
Brown Company
Gottesman & Co., Inc.
Lyddon & Co. (America), Inc
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

PULPSTONES
Norton Company

PULP TESTERS
Testing Machines, Inc.

PULP TREATING
Curlator Corp.

PULVERIZING MILLS
Jeffery Mfg. Co.
F. L. Smidth & Co.

PUMP VALVE BALLS
Stowe-Woodward Inc.

PUMPS
Allis Chalmers Mfg. Co.
Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
DeLaval Steam Turbine Co
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Read Standard Corp.
Ronningen-Petter Co.
Roots Connersville Blower Corp
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
General Dyestuff Corp.
Rohm & Haas Company

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECOVERY SYSTEMS
Babcock & Wilson Co.
Chicago Bridge & Iron Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Peabody Engrg. Corp.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Vulcan Copper & Supply Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Hudson-Sharp Mch. Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REFRACTORIES
Harbison-Walker Refractories Co.

REGULATORS
Airmatic Valve, Inc.
Apmew, Inc.
Bird Machine Company
General Electric Co.
Improved Machinery Inc.
Johnson Corp.
Poirier Control Company
Shartle Brothers Machine Co.
Taylor Instrument Companies
Westinghouse Electric Corp.

RESINS
American Cyanamid Company, Plastics & Resins Division
Borden Company
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Emerson Mfg. Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
B. F. Goodrich Co.
Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stone, Thos. & Geo. M., Inc.
Stowe-Woodward, Inc.
Tyer Rubber Co.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.
Tyer Rubber Co.
U. S. Rubber Co.

ROLL HANDLING EQUIPMENT
Dilts Machine Works

ROLL STANDS
Cameron Machine Co.
Dilts Machine Works
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
Downingtown Mfg. Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY SCREENS
Bird Machine Company

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

RUBBER COVERED ROLLS
Stowe-Woodward Inc.
Tyer Rubber Co.

RUBBER PRODUCTS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.
Tyer Rubber Co.

SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SATURANTS
B. F. Goodrich Chemical Co.

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Bulkley, Dunton Processes, Inc.
Chicago Bridge & Iron Co.
Improved Paper Machinery Corp.
Moore & White Co.
Ronningen-Petter Co.
Shartle Bros. Machine Co.
Walker Process Equipment, Inc.

SAWS
Simonds Saw & Steel Co.
Moore & White Co.

SCALES
Cady & Co., E. J.
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

SCREENS
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SCREENS, CHIP (Vibrating)
Link Belt Co.

SCREENS (Rotary)
Bird Machine Company

SHAKES
Black Clawson Company
Downingtown Mfg. Co.

SHAKE STICKS
Westinghouse Electric Corp.

SHEET MACHINES
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hermann Mfg. Co.
Hudson Sharp Machine Co.
Ronningen-Petter Co.
Testing Machines, Inc.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Moore & White Co.
Ronningen-Petter Co.
Sandy Hill Iron & Brass Works
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Jeffrey Mfg. Co.
Taylor, Stiles & Co.

SIZE PRESSES
Black-Clawson Co.
Downingtown Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

SIZING
American Bitumuls & Asphalt Co.
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SLIME CONTROL
Antara Chemicals Division, General Dyestuff Corp.
The Dow Chemical Company
E. I. du Pont de Nemours & Co.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Company
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SLITTERS
The Bagley & Sewall Company
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson-Sharp Mch. Co.
Improved Machinery Inc.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Paper Converting Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
Chicago Bridge & Iron Co.

SOFTNESS-STIFFNESS TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SOLUBLE OILS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Arnold, Hoffman & Co., Inc.
Nopco Chemical Co.

SOLVENTS
Pennsylvania Ind. Chem. Co.

SPECIAL MACHINERY
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Jackson & Church Co.
Mahon, R. C., Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Paper Converting Machine Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.
Waldron, John, Corp.

SPEED REDUCERS
Dodge Manufacturing Corp.
Downingtown Mfg. Co.
Link Belt Co.
Westinghouse Elec. Corp.

SPLICING TISSUE
Williams-Gray Co.

STAINLESS AND ALLOY CASTINGS
Michigan Steel Casting Co.

STAINLESS STEEL
Armco Steel Corp.
Crucible Steel Co.
U. S. Steel Corp.

STARCH
Clinton Foods, Inc.
Corn Products Sales Co.
The Hubinger Co.
National Starch Products, Inc.

STEAM JET EJECTORS
Elliott Company, Inc.

STEAM JOINTS
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

STEAM SPECIALTIES
Babcock & Wilcox Co.
Johnson Corp.

STEEL
Armco Steel Corp.
Carnegie Illinois Steel Co.
Crucible Steel Co.
Lukens Steel Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD
Babcock & Wilcox Co.
Lukens Steel Company

STEEL TANKS
Chicago Bridge & Iron Co.
Jackson & Church Co.
Mahon, R. C., Co.
Ronningen-Petter Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

STEEL-WELD FABRICATED PARTS
Mahon Company

STOKERS
Westinghouse Elec. Corp.

STRAINER SCREENS
Ronningen-Petter Co.

STRAINERS
Elliott Company, Inc.
Ronningen-Petter Co.

STRETCH TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

STUFF BOXES
Kalamazoo Sheet Metal Mfg. Co.

SUCTION BOX COVERS
Appleton Wood Products
Emerson Mfg. Co.
Moore & White Co.
Westinghouse Electric Corp.

SUCTION BOXES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

SUCTION ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
Manchester Machine Co.

SULPHUR
Texas Gulf Sulphur Co.

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Virginia Smelting Co.

SUPERCALENDERS
The Appleton Machine Co.
B. F. Perkins & Son, Inc.

SWITCHGEAR
Westinghouse Elec. Corp.

SYNTHETIC LATICES
American Cyanamid Company, Industrial Chemicals Division
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.

SYNTHETIC RESINS
American Cyanamid Co., Ind Chem. Div.
Hercules Powder Co., Inc.
Pennsylvania Ind. Chem. Co.
Rohm & Haas Company

SYPHONS
Poirier Control Company
Shartle Bros. Machine Co.

TAILING SCREENS
Sandy Hill Iron & Brass Works

TAKE OFF UNITS
Dilts Machine Works

TALC
American Cyanamid Company, Industrial Chemicals Division
Vanderbilt Co., R. T.

TANKS
Chicago Bridge & Iron Co.
Graver Tank Mfg. Co.
Kalamazoo Sheet Metal Mfg. Co.
Mahon, R. C., Co.
B. F. Perkins & Sons, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stebbins Engrg. Co.

TEARING TESTERS
Thwing-Albert Instrument Co.
Testing Machines, Inc.

TENSILE TESTERS
B. F. Perkins & Son, Inc.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

THICKENERS, DECKERS AND SAVEALLS
The Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Chicago Bridge & Iron Co.
Dilts Machine Works
Downingtown Mfg. Co.
Graver Tank & Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walker Process Equipment, Inc.

TITANIUM
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

TOOLS
Walworth Company

TRACTORS AND TRUCKS
Towmotor Corp.

TRANSFORMERS
Moorhead Elec. Machy. Co.
Westinghouse Elec. Corp.

TRANSMISSIONS
Dodge Mfg. Corp.
Jeffrey Mfg. Co.
Link Belt Co.

TRAPS
Crane Co.
Grinnell Company
Johnson Corporation
Shartle Brothers Machine Co.

TUBE CLEANERS
Elliott Company, Inc.

TUBE MILLS
F. L. Smidth & Co.

TUBES
Aluminum Co. of America
Babcock & Wilcox Co.
Crucible Steel Co.
National Tube Co.

TUBING MACHINES
Dilts Machine Works

TUBING, MECHANICAL
National Tube Co.

TURBINES
De Laval Turbine Co.
Elliott Company, Inc.
General Electric Company
James Leffel Co.
Westinghouse Electric Corp.

UNWINDERS
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Moore & White Co.
Waldron, John, Corp.

USED EQUIPMENT
Gibbs-Brower Co.
Thomas W. Hall Co.
Moorhead Elec. Machy. Co.
J. J. Ross Company
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

V-BELTS
Dodge Mfg. Corp.
Goodrich, B. F., Company, Inc.

VALVES
Airmatic Valve, Inc.
The Bagley & Sewall Company
Crane Company
DeZurik Shower Co.
Dilts Machine Works
Downingtown Mfg. Co.
Grinnell Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Ohio Injector Co.
Powell Valves
Record Fdy. & Mch. Co.
Rockwell Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walworth Company

VAPOR BARRIER COATINGS
Insul-Mastic Corp. of America

VATS
Beloit Iron Works
Biggs Boiler Works Co.
Black-Clawson Co.
Downingtown Mfg. Co.
Mahon, R. C., Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

VIBRATORS
Cleveland Vibrator Co.

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Nopco Chemical Co.
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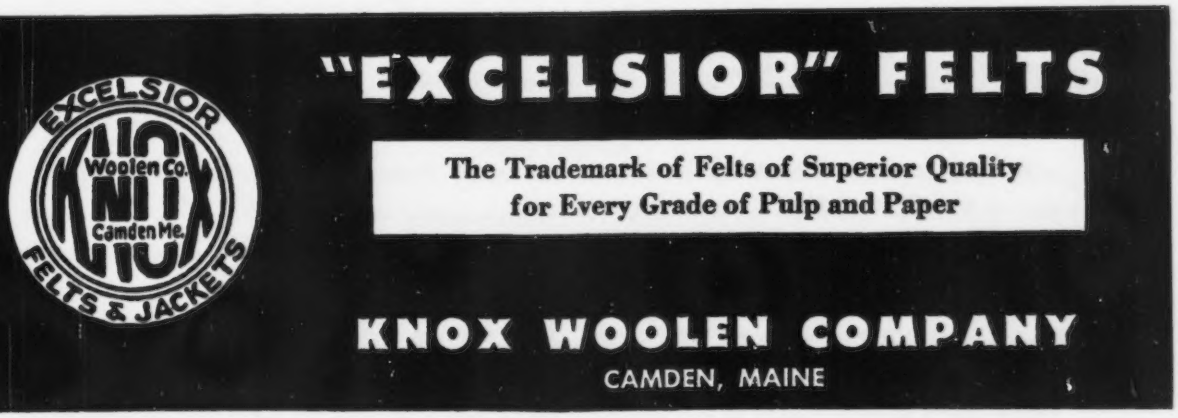

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H. K. Vinton
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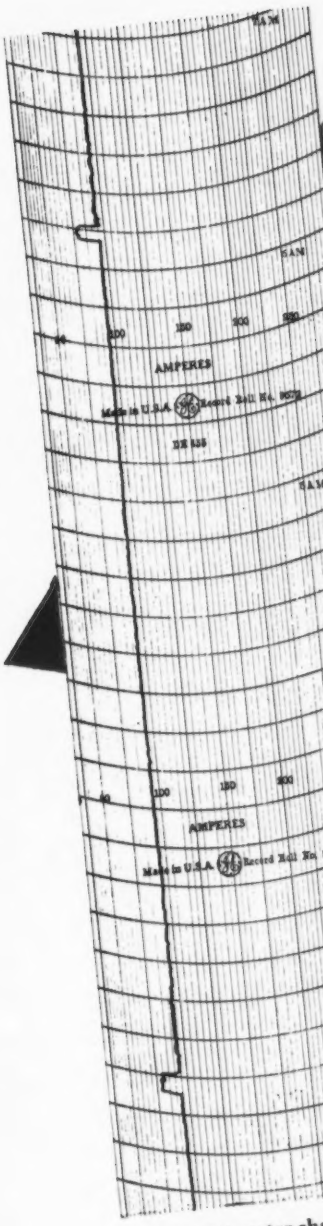
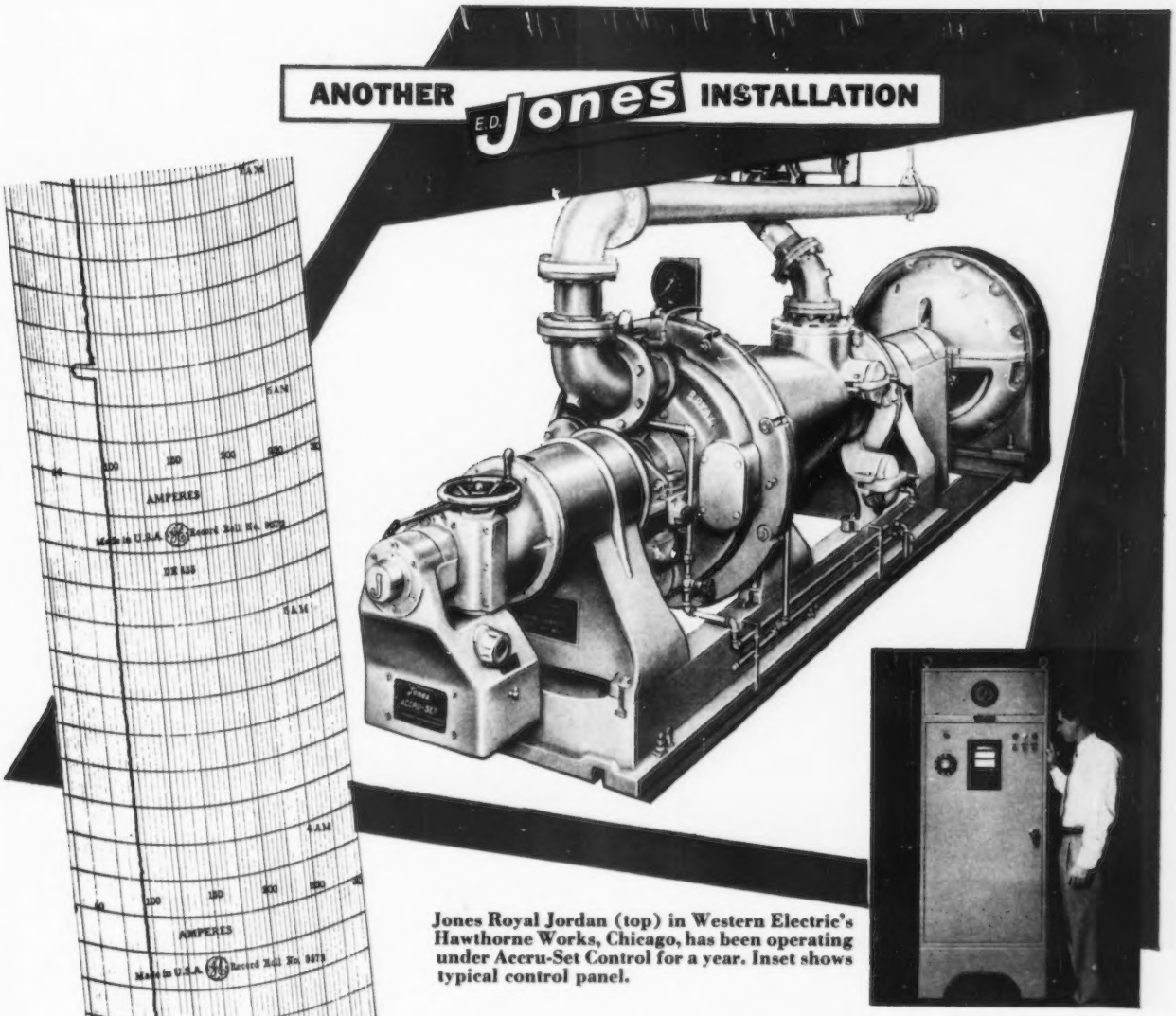


This watt-meter chart shows uniformity of Jordan performance with Accru-Set Control.



Jones Royal Jordan (top) in Western Electric's Hawthorne Works, Chicago, has been operating under Accru-Set Control for a year. Inset shows typical control panel.

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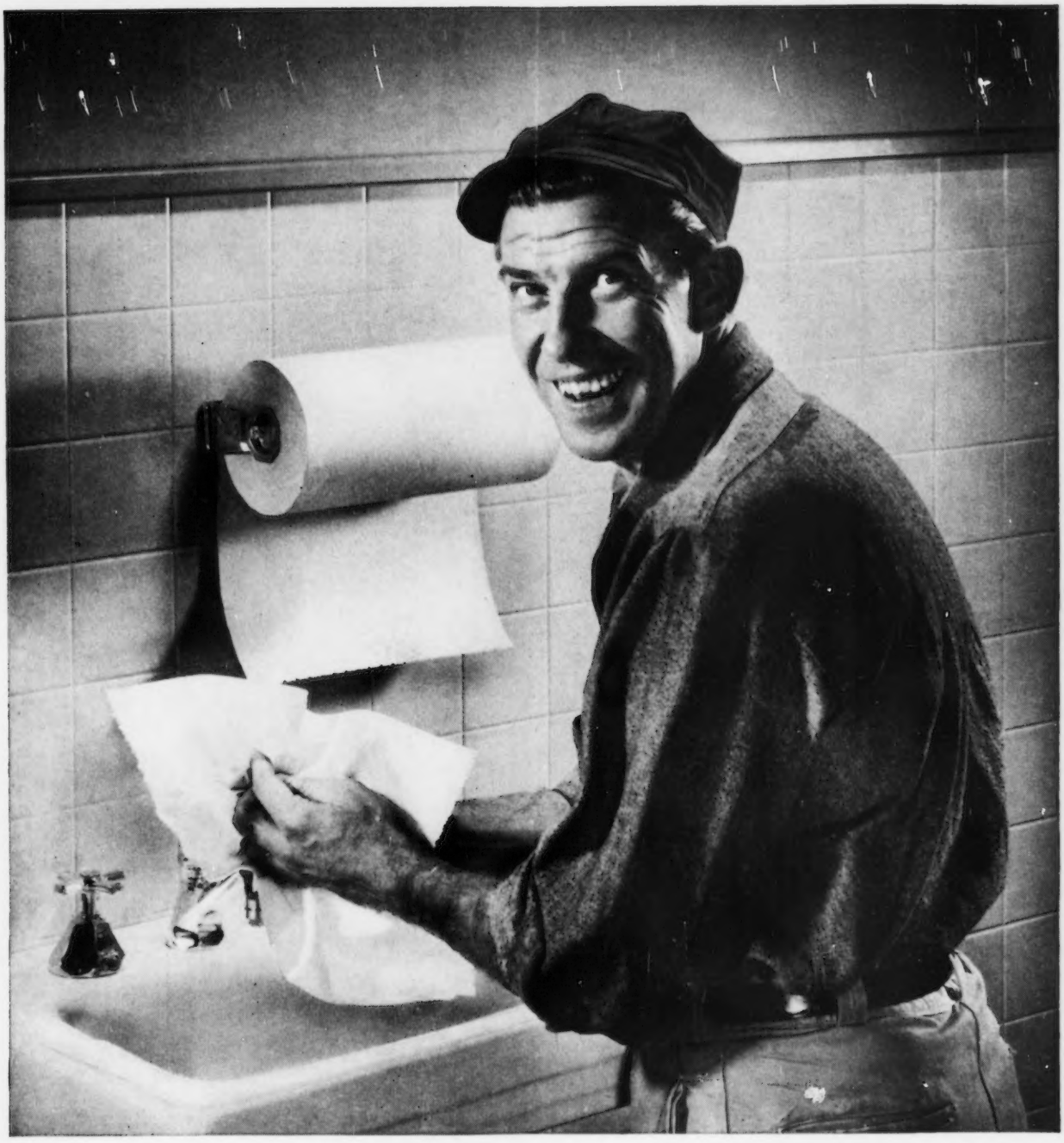

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